

Metal and Engineering Training Package

National code identifier – MEM98

Policy document

*– for the manufacturing and engineering industry
and the boating industry*

– leading to New Apprenticeships

November 1998

This volume contains qualifications, assessment guidelines and national competency standards (part 1). Volumes 1, 2 and 3 contain national competency standards. This volume should not be used in isolation but in the context of the complete Training Package.

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Australian National Training Authority

Level 11, AMP Place

10 Eagle Street

BRISBANE, QLD 4000

Phone: (07) 3246 2300 Fax: (07) 3246 2490

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Published by: Australian Training Products Ltd

Level 25, 150 Lonsdale St

Melbourne 3000

Phone: +61 3 96550600 Fax: +61 3 9639 4684

www.atpl.net.au e-mail: sales@atpl.net.au

First published: November 1998

Stock Code Number: 5040008S

ISBN: 0 642 79928 8

MEM98 Metals & Engineering Training Package – Policy Document

Printed by: Document Printing Australia Pty Ltd

AESharenet Code: P

Print Version No: 4

20 August 2003

IMPORTANT

Training packages are not static documents. Changes are made periodically to reflect the latest industry practices.

Before commencing any form of training or assessment, you must ensure delivery is from the *current version* of the Training Package.

To ensure you are complying with this requirement :

- Check the Print Version Number just below the copyright statement on the imprint pages of your current Training Package.
- Access the ATP website (<http://www.atpl.net.au>) and check the latest Print Number.
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The Modification History is also available on the website of the developer of the Training Package: Manufacturing, Engineering & Related Services Industry Training Advisory Board <http://www.mersitab.com.au>

The National Training Information Service (<http://www.ntis.gov.au>) also displays any changes in Units of Competency and the packaging of qualifications.

Modification History

MODIFICATION HISTORY – ENDORSED MATERIALS			
Please refer to the National Training Information Service for the latest version of Units of Competency and Qualification information (http://www.ntis.gov.au).			
MEM98 Metal and Engineering Training Package			Sheet: 1 of 1
Version	Date of Release	Authorisation:	Comments
4	20/08/03	NTQC	Inclusion of Marine Craft Construction, Boating Services and Jewellery Manufacture resulting in five new qualifications. Revised name of Certificate IV in Engineering, introduction of new and revised units as listed in the details table.
3.00	10/02/03	NTQC	Revised point weighting and introduction of new units as listed in following details table
2.00	01/12/96	NTFC	Details not available
1.00	21/11/98	NTFC	Primary Release
			Pre Training package, standards originally published 1995

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Important

Training Packages are living documents. Changes are periodically made to reflect the latest industry practices.

As a user of the Training Package, and before commencing any form of training or assessment, you must ensure delivery is from the **current version**.

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The Modification History is also visible on the website of the developer of the Training Package: <http://www.mersitab.com.au>

Changes in units of competency and packaging of qualifications are reflected on the National Training Information Service which displays only current information: <http://www.ntis.gov.au>

Introduction

The Metal and Engineering Training Package has been developed by the Manufacturing, Engineering and Related Services Industry Training Advisory Body Ltd. (MERS ITAB) to meet the training and skills recognition needs of the manufacturing and engineering industry in Australia. The Training Package was originally endorsed by the National Training Framework Committee on 10th November 1998.

The Metal and Engineering Training Package links the National Metal and Engineering Competency Standards through sound assessment processes to qualifications. The Training Package has been designed to cover all occupations in the industry, with qualifications from Certificate I to Diploma, including those covered by qualifications in boating services.

The Training Package is supported by a variety of non-endorsed components, including model training pathways and other learning strategy materials as well as assessment materials and professional development programs.

Background

Following the reforms of industry restructuring during the late 1980's, the National Metal and Engineering Training Board (NMETB) introduced a suite of national competency based training courses from 1990 to meet the training needs of the industry. The National Metal and Engineering Curriculum bank of competency based training modules was established to support this initiative. Draft competency standards were progressively developed from the early 1990's and a model implementation program was instigated to trial the introduction of the National Metal and Engineering Competency Standards in enterprises during 1995. The competency standards were refined as a result of this trial and were re-issued in December 1996. The standards have been further refined and expanded during the life of the Training Package.

MERS ITAB is a declared industry training advisory body by the Australian National Training Authority (ANTA). MERS ITAB was formed in January 1996 after a review of national industry training advisory bodies was undertaken by ANTA. MERS ITAB incorporates the NMETB as the national advisory body for the industry sector. The NMETB brings together representatives of large and small employers, key unions and government bodies with an interest in the industry. MERS ITAB operates as a national organisation with a network of state and territory ITABs and boards.

Scope

The Metal and Engineering Training Package (national identifier code MEM98) is designed to replace all existing national industry-supported training courses. The Training Package includes qualification outcomes from Certificate I to Diploma and will be extended to include an Advanced Diploma. The Training Package covers the skills and knowledge development and recognition requirements of people who use the workplace competencies covered by the National Metal and Engineering Competency Standards and specified Competency Standards from other NTQC endorsed training packages. The Metal and Engineering Training Package is designed to be flexible and can be linked to all types of employment arrangements including Australian Workplace Agreements, Certified Agreements as well as Federal and State Awards. It also complements the employment framework formally agreed to by all industrial parties.

Competency standards

All qualifications in the Training Package are based on the National Metal and Engineering Competency Standards and those units specified from other endorsed Training Packages. These standards focus on what is expected of people in workplaces rather than on the learning process. The standards reflect realistic workplace practices across a broad range of situations. This includes the specification of knowledge and skills and the application of that knowledge and skill in the workplace as well as the ability to transfer and apply the competency in new situations, environments and contexts.

The standards are set in a packaging framework designed to facilitate flexibility, multi-skilling and specialisation. The framework is based on the principle that individual units of competency, apart from the very small number of *Core* units, should not be exclusively related to a particular occupation or employment classification level.

Details on the structure of the competency standards are shown below (with the exception of boating services qualifications in which the *Foundation* and *Core* are combined and listed as compulsory core. See Attachment 4 for full listing). Reference must also be made to the Introduction section of the Competency Standards documentation for full details.

Fields

The competency standards are divided into 'fields' as convenient groupings of units to assist the organisation of the standards and to help users in the selection of relevant competency standards. The fields do not set up barriers to accessing any competency units in a field, or between fields.

The competency standards units and fields are divided into three categories:

- Foundation* units (field 1)
- Core* units (field 2)
- Specialisation* units (fields 3 onwards)

Foundation units

Foundation units describe competencies that are a necessary part of the skill profile of every job in the industry. *Foundation* competencies do not carry a points weighting, however they are necessary prerequisites to higher level units and will form part of the skills profile of all employees.

All qualifications in this Training Package include the *Foundation* units of competency. People who hold an existing industry qualification and wish to undertake one of the new Training Package qualifications are deemed to be competent against the *Foundation* units. New entrants to the industry will need to demonstrate competency against the *Foundation* units before being eligible for recognition in higher level competency units.

Core units

The *Core* units define competencies that are common and necessary in the industry. *Core* units have been determined for each qualification level within the Training Package and these *Core* units must be achieved as required for each qualification. The Key Competencies have been mapped against the *Foundation* and *Core* units and achievement of the Metal and Engineering units will also provide recognition against the Key Competencies. A mapping matrix is included in the competency standards to show this relationship.

Core units are allocated to ‘bands’ and the number of required Core units increases for each qualification level. Band 1 Core units apply to qualification outcomes up to Certificate III. For qualification outcomes at Certificate IV and Diploma, band 2 Core units apply as well as the band 1 Core units. Some band 2 Core units can be included in a Certificate III qualification and these are shown in Attachment 1.

Attachment 3 shows a summary of the *Foundation* and *Core* competency units.

Specialisation units

These units describe the diverse range of competencies needed across the industry. The Specialisation units are also divided into ‘bands’, with some overlap between them. The allocation of units to different specialisation bands recognises the inherent differences in the level of difficulty of skills used in the industry. For example, band B skills are more difficult than band A skills. At the same time the large range of units in each band allows enterprises a wide choice. Band E units are independent units developed for the boating services qualifications.

Some Specialisation units are regarded as both band A and band B units. Use of these dual band units is limited and this is shown in the requirements for each qualification. These units are identified in the index to the competency standards as well as in the units themselves by way of a note.

Note that some band A units only appear in qualifications at Certificate III and above as shown in Attachment 1.

Table showing availability of Core and Specialisation units for each qualification

Qualification title	Core units		Specialisation units		
	band 1	band 2	band A	band A/B	band B
Certificate I in Engineering	all	none	some	none	none
Certificate II in Engineering – Production	all	none	some	some	none
Certificate II in Engineering – Production Technology	all	one	some	some	none
Certificate III in Engineering – Production Systems	all	some	all	all	some
Certificate III in Engineering – Mechanical Trade	all	some	all	all	some
Certificate III in Engineering – Fabrication Trade	all	some	all	all	some
Certificate III in Engineering – Electrical/Electronic Trade	all	some	all	all	some
Certificate III in Engineering – Technician	all	all	all	all	all
Certificate III in Engineering – Jewellery	all	some	all	all	some
Certificate III in Marine Craft Construction	all	some	all	all	some
Certificate IV in Engineering	all	all	all	all	all
Diploma of Engineering	all	all	all	all	all

Pre-requisite units

Many competency units indicate whether other specific competencies are required as support in terms of pre-requisite skills and knowledge. Where there are options within the pre-requisites then separate combinations or pre-requisite paths are shown. Where multiple paths (path 1, path 2 etc) are shown then the most appropriate path should be chosen.

Unit weight points

Each unit of competency, with the exception of some of the 50 series units, has an allocated weight shown as ‘unit weight points’. Each qualification includes an identified number of points. The units selected for the qualification must have a combined points

value no less than the points value specified for the qualification. The combined points total also includes the points for any pre-requisite units involved. Note that the points for any particular unit can only be counted once in each qualification. For example, if a unit is selected to be part of a qualification and it is also a pre-requisite for another selected unit, then the points for that unit can only be counted once.

Maintenance of the competency standards

MERS ITAB has an established Metal and Engineering Competency Standards Review Group comprised of key industry stakeholders and ITAB staff. The group subjects the standards to a continuous improvement process whereby feedback on the standards is considered and changes made where appropriate. Feedback and comment is sought from enterprises, industry organisations and training organisations from across Australia.

Changes can include simple editing functions through to development of new units to meet particular industry needs. The standards are viewed as dynamic and changes are incorporated to improve the standards in terms of technical quality, usability, changes in workplace organisation and use of technology.

The competency standards will be progressively reviewed during and after the implementation phase of the Training Package as well as part of an ongoing maintenance function. The standards will be submitted for national endorsement where the changes are sufficient to warrant re-endorsement of the units. It is expected that this process will be dealt with on a cyclical basis, with the frequency determined by the extent of any proposed change.

The Metal and Engineering Training Package is undergoing a major review during the course of 2002-2003, with completion expected in late 2003

Customisation guidelines

MERS ITAB believes that the structure and composition of the Metal and Engineering Training Package provides sufficient flexibility to enable the training and skill recognition requirements of enterprises in the industry to be met. The qualifications in the Training Package are based on the content and structural rules of the Metal and Engineering Competency Standards. Where the needs of an enterprise cannot be met under the standard 'packaging' arrangements for each qualification, there is opportunity for further flexibility through the application of these customisation guidelines.

In general, it is the responsibility of Registered Training Organisations (RTOs) to undertake customisation where required, within the limits set by these guidelines. The guidelines deal with customisation of the competency standards as well as customisation of the qualifications.

Changes to competency standards units

Units of competency may be customised by either or both of the two methods shown below, provided the structure and overall outcome of the competency standards unit is **not changed**.

1. Enterprise specific context may be **added**, including enterprise specific language, terminology and procedures. MERS ITAB will provide advice on request as to the accuracy of any such enterprise specific overlay document.
2. The range of variables may be **changed** to incorporate the context of enterprise applications and procedures etc. For example, the range of machines or other equipment may be changed **provided** the level of skill required or expected is not increased or diminished. In most cases, the range of machines or equipment shown in the Metal and Engineering Competency Standards units is only indicative or illustrative and is not an exhaustive list.

Note that the unit number, title, pre-requisites and unit weight points value must not be changed. Elements and performance criteria cannot be changed except by the addition of detailed information.

Substitution of competency standards units

Provided that the integrity and level of outcome is retained, units of competency in the Metal and Engineering Training Package may be substituted by National Training Quality Council (NTQC) endorsed competency standards units from other industries and/or enterprises in the two situations shown below. Assessment against any substitute or replacement unit must be carried out according to the Assessment Guidelines in the Metal and Engineering Training Package.

Situation 1 – importing competencies from other Training Packages

Twenty percent of the *Specialisation* units (as measured by their points value) may be replaced by units from other NTQC endorsed Training Packages or competency standards. (Note that the *Foundation* and *Core* units cannot be replaced in this situation and that 'stream' rules must be met where applicable).

Situation 2 – substituting Metal and Engineering competencies with others

Where MERS ITAB has, in writing, formally recognised the proposed substitute unit/s as equivalent to the unit/s being replaced then the substitute unit/s may form part of a qualification in the Metal and Engineering Training Package. (Note that it is the proponent's responsibility to propose equivalence, including points weighting, and to provide relevant evidence for consideration by MERS ITAB).

Adding new units to the competency standards

An enterprise may find that, after application of the guidelines for changes to units and/or substitution of units, the competency standards still do not cover skills or processes unique to the enterprise. In these cases, they can ask MERS ITAB to develop or assist in the development of competency standards units to meet the needs of the enterprise.

Alternatively, the enterprise may choose to develop their own enterprise specific standards and seek their endorsement by the NTQC.

Customisation of qualifications by including additional units of competency

Additional units of competency may be added to a qualification under the two situations shown below.

1. Registered Training Organisations may face difficulty in matching MERS ITAB recommended learning strategy support material to the units of competency selected for the particular qualification, and so up to six extra points worth of competency standards units can be included in each of the qualifications in the Training Package. These extra points then form part of the total points for the particular qualification. That is, only the nominal points value of the qualification (without the extra points) can count for advanced standing or progression towards another qualification.

or

2. Additional units of competency may be added to a qualification beyond the minimum requirements specified for that qualification where the additional units are required to meet specific organisational needs of the enterprise and with the agreement of the enterprise. In this case, it should be noted that where the additional units could contribute towards the achievement of a higher level Metal and Engineering Training Package qualification then they should be separately identified in any qualification transcript or statement of attainment.

Customisation of qualifications by use of the packaging and stream rules

Each qualification in the Metal and Engineering Training Package can be customised under the packaging and stream rules through the selection of relevant and appropriate *Specialisation* units of competency.

Customisation of qualification titles

An additional descriptor may be added to any qualification title to illustrate a particular skills profile. This may be achieved by the addition of an occupation/functional stream after the endorsed title as shown on the qualification and/or transcript. This additional descriptor must be drawn from the list provided below and must be shown in brackets. For example Certificate III in Engineering – Mechanical Trade (Refrigeration). No other changes may be made to the qualification titles. Note that the addition of these descriptors to a qualification title does not change the formal title or unique code of the qualification.

MERS ITAB will consider applications from RTOs to extend the range of additional approved descriptors.

Approved descriptors

- Air-conditioning
- Casting and Moulding
- Jewellery
- Locksmithing
- Manufacturing
- Patternmaking
- Refrigeration
- Surface Finishing
- Toolmaking
- Watchmaking

Use of units from the National Metal and Engineering Competency Standards in other training packages or qualifications

Where units from the National Metal and Engineering Competency Standards are to be used in other Training Packages or in customised qualifications which draw on more than one Training Package, and equivalence is sought, then the following conditions apply:

1. Any changes to the units must be made according to these customisation guidelines.
2. Any pre-requisite unit/s must also be included.
3. The MERS ITAB content and structural rules (packaging) of the National Metal and Engineering Competency Standards must be taken into account.
4. Unless all the Metal and Engineering Training Package qualification requirements are met then the title of the customised qualification must be clearly distinguished from a MERS ITAB qualification and in particular the terms 'certificate (level) in engineering' or 'diploma of engineering' or 'advanced diploma of engineering' cannot be used.

It should also be noted that units in the National Metal and Engineering Competency Standards are not determined or established at a particular AQF level but are designed to span a range of AQF levels, depending on their use and application.

Assessment guidelines

Benchmarks for assessment

The current version of the National Metal and Engineering Competency Standards form the benchmarks for assessment in the Metal and Engineering Training Package. The competency standards have been endorsed by the National Training Quality Council (NTQC), MERS ITAB, unions and employer organisations as the national benchmarks for the recognition of skills in the industry. They contain evidence guides, which support, facilitate and focus the assessment process.

Role of Registered Training Organisations

Registered Training Organisations (RTOs) providing training and assessment services for the Metal and Engineering Training Package have the responsibility to ensure the quality of the outcomes. The RTO must make the final assessment decision, based on a judgment of the available evidence. They must ensure that a qualification is only issued when the candidate has satisfied all aspects and requirements of that qualification. RTOs must also ensure that appropriate assessment occurs and that ongoing records of assessment are kept.

Non-RTOs or other parties may use qualified assessors to carry out assessments against the Metal and Engineering Training Package, however the outcomes will only be recognised against the Metal and Engineering Training Package if the assessment is conducted under the auspices of a RTO authorised to deliver and/or assess against the Training Package.

The minimum level of reporting assessment outcomes is at the unit level. Assessment outcomes must primarily be *reported without grading* on the basis of the candidate being either *competent* or *not yet competent*. However this does not preclude supplementary reporting based on endorsed quality principles. Supplementary reporting of graded assessment may occur where there is *agreement* between the Registered Training Organisation and their client. Any supplementary reporting of graded assessment outcomes must be shown as additional information on any testamur or transcript and not detract or obscure the primary outcome report.

Assessment pathways

MERS ITAB defines assessment in accordance with the Assessment Principles adopted in principle by vocational education and training Ministers. Assessment made against the competency standards must ensure that competency can be demonstrated in a workplace situation. A workplace situation can be simulated in many cases, however a few units of competency indicate that assessment should be carried out in a workplace. In these cases, the RTO should arrange for appropriate assessment evidence to be gathered from the workplace so that an assessment decision can be made. This does not mean nor imply that RTO staff will need to attend the workplace to undertake workplace assessment activities. Workplace Assessors registered with MERS ITAB could be viewed as a valuable assessment resource for RTOs. In all cases, it is important that sufficient and appropriate authentic evidence is gathered to ensure that the assessment decision is fair, valid and reliable.

MERS ITAB considers that assessment of competency should be carried out as a process and not a single event. Where work is complex and high skill levels are expected, then demonstration of competency should occur across a range of situations and/or applications.

It should be noted that competency must be demonstrated in all elements of a competency standards unit as well as satisfying any pre-requisite requirements before 'competency' can be granted.

Other than for pre-requisite competencies, there is no specified order to the assessment of competencies. Assessors are encouraged to assess groups of units holistically and not adopt an atomised unit by unit approach. Holistic assessment should also be used wherever possible as one means of dealing with pre-requisite units.

Recognising prior learning

The industry views all learning prior to assessment as 'prior learning'. This includes relevant prior learning and competencies acquired through previous work, life and training or educational experiences and should be recognised during the assessment process. Assessing prior learning must be undertaken by a qualified assessor, using original evidence and other assessment tools as required to determine competency.

Assessor requirements

Assessments against competencies in the Training Package will be carried out in accordance with these endorsed guidelines and the specification included in the competency standards. The guidelines include the necessary qualifications for those conducting assessments and provide for those situations where more than one person may contribute to the assessment and where the required technical and assessment competencies may not all be held by any one person.

Assessor qualifications

Assessors must meet the three minimum requirements outlined below.

1. Competency in the following endorsed competency standards for assessment as included in the *Training Package for Assessment and Workplace Training BSZ98*:
 - Plan Assessment (BSZ401A)
 - Conduct Assessment (BSZ402A)
 - Review Assessment (BSZ403A)

Individuals can meet these requirements by completion of a recognised training program or have other qualifications and/or experience recognised through an approved process as equivalent to the above units. Note that these competency standards units replace the previous Assessment Competency Standards and Extension Unit.

2. Competency in the unit/s being assessed (note that more than one person may contribute to the assessment where the required technical and assessment competencies are not all held by any one person).
3. Familiarity with the National Metal and Engineering Competency Standards and the agreed industrial processes for their implementation in workplaces. MERS ITAB can provide a list of approved organisations that can provide an *Implementing Competency Standards Program* to assist assessors to meet the above requirement.

Using qualified assessors

Final assessment decisions must be made by qualified assessors who are either competent in the unit(s) being assessed or agree to work with others who have technical expertise. In these cases, the RTO should arrange for appropriate assessment evidence to be gathered from the technical expert so that an assessment decision can be made. The technical expert may be part of the RTO's resources, or located in the candidate's workplace, or otherwise available for the purpose.

Guidelines for designing assessment materials

The National Metal and Engineering Competency Standards form a basis for the design of assessment materials. Close attention must be paid to the performance criteria, range of variables and evidence guides. The 'Assessor guide' columns provide indications and guidance for assessors on the type of evidence required to be able to make a valid assessment decision. These columns provide the basis for assessors to prepare assessment tools to suit the candidate and the context of the assessment.

Assessors must use methods that enable the gathering of valid, sufficient, accurate, consistent, current and authentic evidence to allow for assessment decisions to be made. The process must also be valid, reliable, flexible, fair and cost effective. These terms will form the basic criteria for quality assurance measures to ensure the design effectiveness of assessment materials used in the industry and are explained below.

- valid** The assessment actually assesses what it claims to assess, integrating knowledge and skills with their practical application. Language and literacy requirements during assessment should be no greater than the levels required to demonstrate competency in the unit being assessed.
- reliable** The assessment process must be able to produce consistent results, no matter who does the assessment or when the assessment is done.
- flexible** The assessment should be able to be conducted in a variety of situations. It should allow for diversity in how, where and when competencies have been acquired.
- fair** The method chosen must not disadvantage (or advantage) any person, with reasonable adjustments made to assessment procedures and methods for people with special needs. Assessment tasks should be determined with the participation of the person being assessed. See also *Valid* above.
- cost effective** The process must be as cost effective as possible in terms of both time and money costs for enterprises and RTOs.

MERS ITAB will undertake ongoing review and maintenance of these Assessment Guidelines and is committed to ensuring that the assessment process does not place an undue cost burden on the industry and the training system. MERS ITAB will work closely with RTOs to assist in establishing ways of offsetting and minimising the costs of any workplace assessment activity.

The recommended assessment methods encompass a range of techniques, which include, but are not limited to, the use of:

- direct observation of performance
- simulations of workplace activities
- oral questioning
- practical exercises
- projects/assignments
- work portfolios

In the interests of both holistic approaches to assessment and cost-effective practices, assessors are encouraged to develop assessment methods that enable the measurement of a number of related competencies through one assessment process or event. For example, it is likely that all of the *Foundation* units and most *Core* units of competency will not require separate assessment or even separate training. It is more likely that both training and assessment for these units will be integrated with one or more *Specialisation* units.

Guidelines for conducting assessments

Before any assessment takes place at a workplace, employers, employees and any service provider need to establish an assessment process through consultation which meets the needs of the enterprise and is acceptable to all interested parties. Some workplaces use a training committee or a consultative committee for this purpose. When RTOs need to gather assessment evidence from the workplace they should have regard for any enterprise needs, practices and processes.

Assessment procedures must be transparent and address the key assessment principles of being valid, reliable, flexible, fair and cost effective (see above). Assessment should be conducted in a non-threatening atmosphere. The assessor needs to establish rapport with the assessment candidate, and provide timely feedback. The assessment process should foster communication between assessment candidates and assessors, and ensure that:

- the assessment candidate knows and agrees to the assessment procedures before assessment takes place
- assessments take place when the assessment candidate is ready to undertake the assessment. Before undertaking formal assessment tasks, assessment candidates should be encouraged to conduct self-assessment according to the agreed assessment criteria to test their own readiness
- wherever practicable, assessment evidence is gathered on a number of occasions and in a variety of contexts/situations
- during the assessment period, assessors and assessment candidates engage in feedback and discussion, and can seek assistance to have disagreements resolved expeditiously
- records of assessments remain confidential

Sources of information on assessment

MERS ITAB national and state/territory offices as well as the industry parties to MERS ITAB can provide additional information and guidance on assessment issues. Contact details are contained in the National Metal and Engineering Competency Standards Implementation Guide, 1997.

Other sources of information are shown below:

- A Guide to the Competency Standards for Assessment, 1997 ANTA
- Assessment Arrangement in the National Training Framework, 1996 ANTA
- Assessment System Design, 1994 J S McMillan
- Assessment Technical Manual, 1994 J S McMillan
- Assuring Quality and Choice in National Training, 1997 ANTA
- Competency Standards for Assessment, 1995 ANTA
- Final Report Assessment Research and Development Project, 1996 MERS ITAB
- Framework for competency based assessment in vocational education and training in Western Australia, 1997 State Training Board and Training Accreditation Council of Western Australia
- Implementation of Metal & Engineering Assessment Framework: Final Report to ANTA, 1997 MERS ITAB
- Integrating Assessment of Learning Outcomes: an Approach to Holistic Assessment, 1996 Assessment Centre for Vocational Education, NSW TAFE
- Making Sense: Addressing Language, Literacy & Numeracy Issues in Workplace Assessment, 1998 MERS ITAB
- Metal and Engineering Assessor Registration Procedure, 1998 MERS ITAB
- Metal and Engineering Industry National Competency Standards (Volume 1-2), 1998 MERS ITAB
- National Metal and Engineering Competency Standards Implementation Guide, 1999 MERS ITAB
- On-the-job and Off-the-job Assessment - an Issues Paper, 1994 Assessment Centre for Vocational Education, NSW TAFE
- Resource Manual for Registered Workplace Assessors, 1997 MERS ITAB
- Rumsey, David, Practical Issues in Workplace Assessment, in National Assessment Research Forum, VEETAC Competency Based Training Working Party, Sydney

Qualifications

Overview of structure

Each qualification is comprised of units of competency combined in a packaging framework. The framework is based on the structure of the competency standards and follows simple rules.

In general, each qualification is comprised of the *Core* units of competency relevant to the qualification level as well as a selection of *Specialisation* units. The Engineering Trade, Engineering Production, Jewellery Manufacture and Marine Craft Construction qualifications at Certificate III also include *Specialisation* units in a 'stream' cluster. For these qualifications, a minimum of 40 points value of units must be selected from the appropriate list in Attachment 2 to obtain the particular stream outcome. As stated previously, the Boating Services qualifications are structured differently to the other qualifications covered by the Package and are covered in a discrete Boating Industry qualifications section.

MERS ITAB will monitor the implementation of the Metal and Engineering Training Package, including the use and application of the packaging framework for the qualifications. Part of this monitoring role will include the consideration of claims by Registered Training Organisations (RTOs) where they have a customer need that cannot be accommodated within the stream rules or customisation guidelines.

The qualifications have been designed to meet the training and skills recognition needs of the industry and are suited to New Apprenticeships.

Summary of Training Package qualifications

Qualification title	Minimum points required	Industrial 'C' level outcome
Certificate I in Engineering MEM10198	16	C13
Certificate II in Engineering – Production MEM20198	32	C12
Certificate II in Engineering – Production Technology MEM20298	64	C11
Certificate III in Engineering – Production Systems MEM30198	96	C10
Certificate III in Engineering – Mechanical Trade MEM30298	96	C10
Certificate III in Engineering – Fabrication Trade MEM30398	96	C10
Certificate III in Engineering – Electrical/Electronic Trade MEM30498	96	C10
Certificate III in Engineering – Technician MEM30598	Year 12 +40 ¹	C9
Certificate III in Jewellery Manufacture MEM30803	96	C10
Certificate III in Marine Craft Construction MEM30603	96	C10
Certificate IV in Engineering MEM40103	132 or AQF III + 36 ²	C7
Diploma of Engineering MEM50198	Year 12 + 80 ³ or AQF III + 60 ⁴	C5
Advanced Diploma of Engineering (proposed)	to be finalised ⁵	C3, C2a

Boating Services qualifications
Certificate I in Boating Services MEM10203
Certificate II in Boating Services MEM20303
Certificate III in Boating Services MEM30703
Certificate IV in Boating Services MEM40203

¹ Completion of Year 12 (or equivalent) with appropriate Maths and Science (some people may require additional bridging training). The 40 points are comprised of 14 points from the specified band 1 *Core* units, 6 points in units drawn from *Specialisation* band A units, and 20 points drawn from *Specialisation* band B units and/or band 2 *Core* units.

² Completion of units to meet the requirements of a Certificate III in Engineering – Trade plus 36 points in units drawn from *Specialisation* band A and/or band B units and/or band 2 *Core* units (maximum 24 points from band A).

³ Completion of Year 12 (or equivalent) with appropriate Maths and Science (some people may require additional bridging training). The 80 points are comprised of 14 points from the specified band 1 *Core* units, 16 points of band 2 *Core* units and 50 points of *Specialisation* band A and/or band B units (maximum 24 points from band A).

⁴ Completion of units to meet the requirements of a Certificate III in Engineering – Trade or Production plus 16 points in units drawn from band 2 *Core* units and 44 points of *Specialisation* band A and/or band B units (maximum 24 points from band A).

Note that up to 20 points of *Specialisation* band B units and/or band 2 *Core* units achieved in the *Certificate III in Engineering – Technician* qualification can be recognised for advanced standing in the *Diploma of Engineering*, that is a minimum of 40 additional points must be achieved.

⁵ Competency standards for this qualification are under development.

Schedule of requirements for Training Package qualifications

Certificate I in Engineering MEM10198	16 points total	C13 outcome
<ul style="list-style-type: none"> • all Foundation units, plus • 16 points in units drawn from Specialisation band A units other than those shown in Attachment 1 		
Certificate II in Engineering – Production MEM20198	32 points total	C12 outcome
<ul style="list-style-type: none"> • all Foundation units, plus • 2 points of band 1 Core units required for C12, plus • 30 points in units drawn from Specialisation band A units other than those shown in Attachment 1 		
Certificate II in Engineering – Production Technology MEM20298	64 points total	C11 outcome
<ul style="list-style-type: none"> • all Foundation units, plus • 10 points of required band 1 Core units for C11, plus • 54 points in units drawn from Specialisation band A units other than those shown in Attachment 1 		
Certificate III in Engineering – Production Systems MEM30198	96 points total	C10 outcome
<ul style="list-style-type: none"> • all Foundation units, plus • 20 points of band 1 Core units required for C10, plus • 40 points in units drawn from the 'Production' stream Specialisation band A units (see Attachment 2), plus • 36 points in units drawn from Specialisation band A units (including dual band A/band B units) 		
Certificate III in Engineering – Technician MEM30598	Year 12 +40 points or AQF III + 12	C9 outcome
<ul style="list-style-type: none"> • all Foundation units, plus • Completion of Year 12 (or equivalent) with appropriate Maths and Science (some people may require additional bridging training), plus • 14 points of band 1 Core units 2.1C12, 2.2C11, 2.3C11, 2.4C11, 2.5C11, 2.6C10, plus • 26 points in units drawn from Specialisation band A and/or band B units (including dual band A/band B units) and/or band 2 Core units (minimum of 20 points from band B/band 2 Core) <p>or</p> <ul style="list-style-type: none"> • Completion of units to meet the requirements of a Certificate III in Engineering – Trade or Production, plus • 12 points in units drawn from Specialisation band A and/or band B units and/or band 2 Core units (including dual band A/band B units) 		
Certificate III in Engineering – Mechanical Trade MEM30298	96 points total	C10 outcome
<ul style="list-style-type: none"> • all Foundation units, plus • 20 points of band 1 Core units required for C10, plus • 40 points in units drawn from the 'Mechanical' stream Specialisation band A units (see Attachment 2), plus • 36 points in units drawn from Specialisation band A units (including dual band A/band B units) 		

Certificate III in Engineering – Fabrication Trade MEM30398	96 points total	C10 outcome
<ul style="list-style-type: none"> • all Foundation units, plus • 20 points of band 1 Core units required for C10, plus • 40 points in units drawn from the 'Fabrication' stream Specialisation band A units (see Attachment 2), plus • 36 points in units drawn from Specialisation band A units (including dual band A/band B units) 		
Certificate III in Engineering – Electrical/Electronic Trade MEM30498	96 points total	C10 outcome
<ul style="list-style-type: none"> • all Foundation units, plus • 20 points of band 1 Core units required for C10, plus • 40 points in units drawn from the 'Electrical/electronic' stream Specialisation band A units (see Attachment 2), plus • 36 points in units drawn from Specialisation band A units (including dual band A/band B units) 		
Certificate III in Jewellery Manufacture MEM30803	96 points total	C10 outcome
<ul style="list-style-type: none"> • all Foundation units, plus • 20 points of band 1 Core units required for C10, plus • 40 points in units drawn from the 'Jewellery Manufacture' stream Specialisation band A units (see Attachment 2), plus • 36 points in units drawn from Specialisation band A units (including dual band A/band B units) 		
Certificate III in Marine Craft Construction MEM30603	96 points total	C?? outcome
<ul style="list-style-type: none"> • all Foundation units, plus • 20 points of band 1 Core units required for C10, plus • 40 points in units drawn from the 'Marine Craft Construction' stream Specialisation band A units (see Attachment 2), plus • 36 points in units drawn from Specialisation band A units (including dual band A/band B units) 		

Certificate IV in Engineering MEM40103	132 or AQF III + 36	C7 outcome
<ul style="list-style-type: none"> • all Foundation units, plus • 20 points of band 1 Core units required for C10, plus • 112 points in units drawn from Specialisation band A units and/or band B units (including dual band A/band B units) and/or band 2 Core units (minimum of 12 points from band B/band 2 Core) <p>or</p> <ul style="list-style-type: none"> • Completion of units to meet the requirements of Certificate III in Engineering – Trade, Certificate III in Engineering – Marine Craft Construction, Certificate III Marine (Installation), Certificate III Marine (Mechanics) or Certificate III in Jewellery Manufacture, plus • 36 points in units drawn from Specialisation band A and/or band B units (including dual band A/band B units) and/or band 2 Core units (maximum 24 points from band A) 		

Diploma of Engineering MEM50198	Year 12 + 80 points or AQF III + 60	C5 outcome
<ul style="list-style-type: none"> • all Foundation units, plus • Completion of Year 12 (or equivalent) with appropriate Maths and Science (some people may require additional bridging training), plus • 14 points of band 1 Core units 2.1C12, 2.2C11, 2.3C11, 2.4C11, 2.5C11, 2.6C10, plus • 16 points of band 2 Core units required for C5, plus • 50 points in units drawn from Specialisation band A and/or band B units (including dual band A/band B units) (maximum 24 points from band A) <p>or</p> <ul style="list-style-type: none"> • Completion of units to meet the requirements of a Certificate III in Engineering – Trade, Production, Jewellery Manufacture or Marine Craft Construction, plus • 16 points of band 2 Core units required for C5, plus • 44 points in units drawn from Specialisation band A and/or band B units (including dual band A/band B units) (maximum 24 points from band A) <p>or</p> <ul style="list-style-type: none"> • Completion of units to meet the requirements of a Certificate III in Engineering – Technician, plus • 16 points of band 2 Core units required for C5, plus • 44 points in units drawn from Specialisation band A and/or band B units (including dual band A/band B units) (maximum 24 points from band A) • Note that up to 20 points from Specialisation band B units and/or band 2 Core units achieved in the Certificate III in Engineering – Technician qualification can be recognised for advanced standing in the Diploma in Engineering, that is a minimum of 40 additional points must be achieved. 		

Boating Industry qualifications information

Introduction

New and revised Boating Industry qualifications were developed by MERS ITAB and submitted to the National Training Quality Council (NTQC) for endorsement as a variation to the MEM98 Metal and Engineering Training Package in February 2003.

These five new qualifications and one revised qualification are complemented by other existing Training Package qualifications from the Automotive and Light Manufacturing ITABs to meet the training and skills recognition needs of the boating industry, particularly the recreational sector in Australia from AQF I to AQF IV.

Background

The new and revised qualifications were a culmination of several years of research and development into the skills and training needs of the various sectors that collectively make up the boating industry.

The industry defines itself as 'incorporating all activities undertaken in or from Australia associated with the design, manufacture, maintenance, service and repair, transport, crewing, storage, marketing, management or retailing of boats and boating products for recreational purposes'.

The industry is typically dominated by small businesses operating around the coastal and inland waterways of the nation. The industry is not concentrated in the capital cities with many of the key locations geographically remote from major centres. There are also a number of larger enterprises within the industry, mostly involved in the manufacture, sales and export of luxury pleasure cruisers.

It should be noted that 'boats' includes marine vessels up to 50 tonnes. By ANZSIC definition vessels larger than 50 tonnes are 'ships'. MERS ITAB covers boatbuilding as well as shipbuilding and associated activities. Shipbuilding is already covered under the endorsed Metal and Engineering Training Package.

Historically, some of the 'boating' vocational areas have been able to access reasonable training arrangements via existing programs, generally linked to the trades such as boatbuilder or marine mechanic, whilst those with more diverse needs or distant from training facilities have encountered difficulties obtaining skills training. Much of the industry operates around marine facilities such as marinas, slipways, boatbuilding and storage facilities and charter bases in both tourist destinations and 'out of the way' locations.

To meet these needs, MERS ITAB has now developed a range of qualifications in Boating Services as well as a new trade qualification in Marine Craft Construction. These qualifications have been designed to meet the training and skills recognition needs of the Boating Industry and are suited to New Apprenticeships.

Scope of Boating Industry qualifications

The new 'boating' qualifications range from Certificate I to Certificate IV across the fields of Marine Craft Construction/Engineering and Boating Services.

These qualifications use a number of existing, endorsed training outcomes and competency standards drawn from related industries as well as offering boating specific skills for enterprises operating across a range of areas such as marinas, slipways, brokerage and charter bases. The qualifications and packaging rules can be found are contained herein. All of the qualifications covered are accessible through New Apprenticeship arrangements.

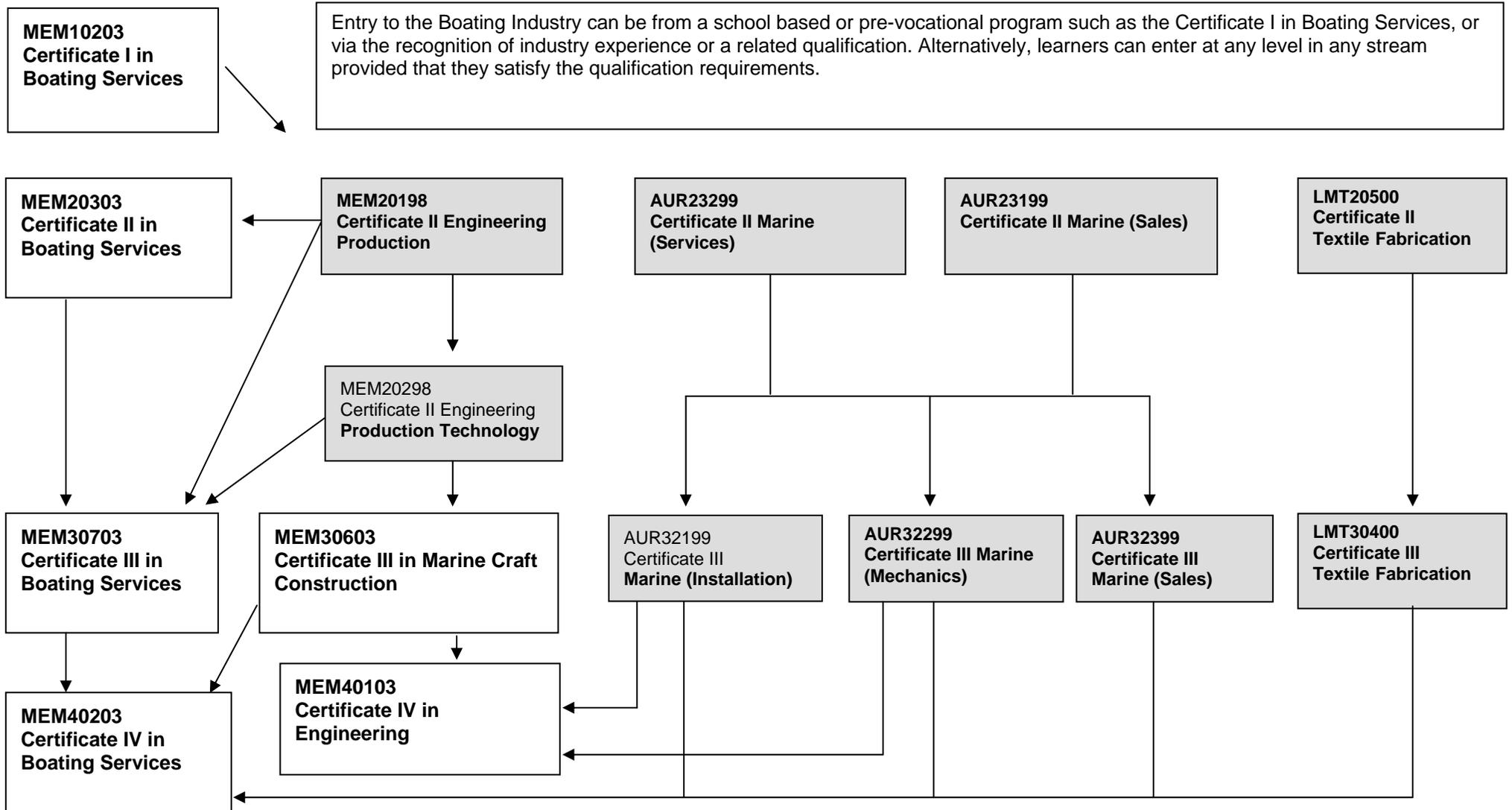
Overview of structure

Each qualification is comprised of units of competency combined in a packaging framework. The framework is based on the structure of the competency standards and follows simple rules.

In general, each of the Boating Services qualifications is comprised of core units of competency relevant to the qualification level as well as a selection of elective units (see Attachment 4 for listed units).

The Certificate III in Marine Craft Construction is comprised of *Core* units relevant to the qualification level as well as a selection of *Specialisation* units. Furthermore, the Certificate III in Marine Craft Construction qualification, as with other engineering qualifications, has an additional requirement of a minimum of 40 points value being selected from a prescribed list of competencies to obtain a stream outcome. The Certificate III in Marine Craft Construction articulates with the Certificate IV in Engineering (also see Schedule of Requirements in Metal and Engineering section), as do the Certificate III Marine (Installation) and Certificate III Marine (Mechanics).

Qualifications and pathways chart for the boating industry from AQF I to IV



Summary of Boating Industry qualifications

Qualification title	Minimum core units required	Minimum elective units required
Certificate I in Boating Services MEM10203	7	3
Certificate II in Boating Services MEM20303	9	6
Certificate III in Boating Services MEM30703	9	14
Certificate IV in Boating Services MEM40203	9	20

Summary of Marine Construction and related qualifications

Qualification title	Minimum points required	Industrial 'C' level outcome
Certificate I in Engineering MEM10198	16	C13
Certificate II in Engineering – Production MEM20198	32	C12
Certificate II in Engineering – Production Technology MEM20298	64	C11
Certificate III in Marine Craft Construction MEM30603	96	C10
Certificate IV in Engineering MEM40103	132 or AQF III + 36	C7

Schedule of requirements for Training Package qualifications

Certificate I in Boating Services MEM10203	7 core units	3 elective units
<ul style="list-style-type: none"> 10 units required in total (see Attachment 4 for details) 		
Certificate II in Boating Services MEM20303	9 core units	6 elective units
<ul style="list-style-type: none"> 15 units required in total (see Attachment 4 for details) 		
Certificate III in Boating Services MEM30703	9 core units	14 elective units
<ul style="list-style-type: none"> 23 units required in total (see Attachment 4 for details) 		
Certificate IV in Boating Services MEM40203	9 core units	20 elective units
<ul style="list-style-type: none"> 29 units required in total or Certificate III in Marine Craft Construction, Certificate III in Marine (Installation), Certificate III in Marine (Mechanics), Certificate III in Marine (Sales), Certificate III in Textile Fabrications, plus 8 units from specified list (see Attachment 4 for details) 		
Certificate III in Marine Craft Construction MEM30603	96 points total	C10 outcome
<ul style="list-style-type: none"> all Foundation units, plus 20 points of band 1 Core units required for C10, plus 40 points in units drawn from the 'Marine Craft Construction' stream Specialisation band A units (see qualification structure or Attachment 2), plus 36 points in units drawn from Specialisation band A units (including dual band A/band B units) <p>This qualification is covered in the Metal and Engineering section and Attachment 4</p>		
Certificate IV in Engineering MEM40103	132 points or AQF III + 36	C7 outcome
<ul style="list-style-type: none"> all Foundation units, plus 20 points of band 1 Core units required for C10, plus 112 points in units drawn from Specialisation band A units and/or band B units (including dual band A/band B units) and/or band 2 Core units (minimum of 12 points from band B/band 2 Core) or Completion of units to meet the requirements of Certificate III in Engineering – Trade, Certificate III in Engineering – Marine Craft Construction, Certificate III Marine (Installation) or Certificate III Marine (Mechanics), plus 36 points in units drawn from Specialisation band A and/or band B units (including dual band A/band B units) and/or band 2 Core units (maximum 24 points from band A) <p>Note - See Metal and Engineering section for articulation details.</p>		

Attachment 1 – Competency standards units which appear in Certificate III or higher qualifications

2.10C5	Write reports
2.11C5	Research and prepare presentations and reports
2.13C5	Perform mathematical computations
2.14C5	Use graphical techniques and perform simple statistical computations
2.15C5	Operate in an autonomous team environment (SEE NOTE BELOW)
4.10A	Develop and manufacture wood patterns
4.11A	Produce polymer patterns
4.12A	Assemble plated patterns
4.13A	Develop and manufacture polystyrene patterns
4.14A	Develop and manufacture production patterns
4.15A	Develop and manufacture vacuum forming moulds and associated equipment
4.16A	Develop and manufacture precision models
4.17A	Develop and manufacture gear, conveyor screws and propeller patterns
5.16A	Perform advanced welding using (MMAW)
5.18A	Perform advanced welding using (GMAW)
5.20A	Perform advanced welding using (GTAW)
5.22A	Perform advanced welding using (OAW)
5.36A	Repair/replace/modify fabrications
5.38A	Advanced geometric development – Cylindrical/Rectangular
5.39A	Advanced geometric development – Conical
5.40A	Advanced geometric development – Transitions
7.2A	Perform precision shaping/planing/slotting operations
7.9A	Perform precision jig boring operations
7.10A	Perform tool and cutter grinding operations
7.11A	Complex milling operations
7.12A	Complex grinding operations
7.21A	Perform complex lathe operations
7.23B	Program and set up CNC manufacturing cell
10.3A	Install and test electrical circuits up to 1000 volts AC to 1500 volts DC
10.4A	Enter and change programmable controller operational parameters
10.6A	Install machine/plant
12.3A	Precision mechanical measurement
12.4A	Precision electrical/electronic measurement
12.6A	Mark off/out (general engineering)
12.7A	Mark off/out structural fabrications and shapes
14.1B	Schedule material deliveries
14.3B	Undertake basic production scheduling
16.1B	Give formal presentations and take part in meetings
18.6A	Dismantle/repair/replace/assemble and fit engineering components
18.45A	Fault find/repair AC and DC elect. equip't/components up to 240 v single phase etc.
18.46A	Fault find/repair AC and DC elect. equip't/components up to 1000v AC to 1500v DC
18.48A	Fault find and repair/rectify basic electrical circuits
18.62A	Install, maintain and calibrate instrument sensors, transmitters & final control elements

NOTE – Competency unit 2.15C5 *Operate in an autonomous team environment* may be included in a Certificate II in Engineering – Production Technology or higher qualification.

Attachment 2 – Competency standards ‘stream’ units for Certificate III ‘Production’ and ‘Trade’ qualifications

Units of at least 40 points value must be drawn from the fields and/or units shown under each stream heading below to obtain the particular stream outcome.

Any combination of units may be selected from the ‘stream’ lists to make up the 40 points provided that any pre-requisite requirements are met.

Note that pre-requisite units for the selected ‘stream’ units may be included in the 40 ‘stream’ points, including where the pre-requisite units are from other fields not included in the chosen stream.

Production stream

Assembly field (all 3 series units)
 Surface finishing (all 8 series units)
 Materials handling field (all 11 series units)
 Quality field (all 15 series units)
 4.1A, 4.2A, 4.3A, 4.4A and 4.6A
 5.1A, 5.2A, 5.3A
 6.3A, 6.4A, 6.6A
 7.1A, 7.3A, 7.4A, 7.24A, 7.25A, 7.26A,
 7.27A, 7.28A
 9.2A
 12.1A, 12.2A
 13.3A, 13.4A
 18.1A, 18.2A

Electrical/Electronic stream

5.1A, 5.2A, 5.3A, 5.6A
 9.1A, 9.2A
 10.2A, 10.3A
 12.2A, 12.4A
 18.1A, 18.2A
 18.45A to 18.65A inclusive

Fabrication stream

Fabrication field (all 5 series units)
 Casting and moulding field (all 4 series units)
 Surface finishing field (all 8 series units)
 3.3A
 9.1A, 9.2A
 10.1A
 12.7A
 18.1A, 18.2A

Marine Craft Construction stream

Marine craft construction field (all 25 series units)
 4.18A
 8.11A, 8.14A
 9.21A
 10.13A
 12.7A
 50.2A, 50.3A, 50.4A, 50.9A

Mechanical stream

Machining field (all 7 series units)
 Maintenance and diagnostics field (all 18 series units)
 9.1A, 9.2A
 10.4A, 10.6A
 12.3A, 12.6A
 13.7A

Jewellery stream

Jewellery and horological field (all 19 series units)
 3.1A, 3.2A, 3.6A, 3.7A
 5.6A
 6.7A
 7.1A, 2.24A, 7.32A
 8.1A, 8.2A, 8.3A, 8.10A, 8.11A
 9.1A
 13.2A, 13.3A, 13.4A
 15.4A
 8.1A, 18.2A, 18.3A

Attachment 3 – *Foundation and Core competencies*

Foundation competency units

Unit code	Unit title	Points
MEM1.1FA	Undertake interactive workplace communication	0
MEM1.2FA	Apply principles of occupational health and safety in a work environment	0
MEM1.3FA	Apply quality procedures	0
MEM1.4FA	Plan to undertake a routine task	0

Core competency units - band 1

At Certificate II in Engineering – Production (C12), the Foundation units and the C12 Core unit is needed.

Unit code	Unit title	Points
MEM2.1C12A	Apply quality systems	2
Total Core points at C12		2

At Certificate II in Engineering – Production Technology (C11), the Foundation units, C12 Core unit and C11 Core units are required.

Unit code	Unit title	Points
MEM2.2C11A	Organise and analyse information	2
MEM2.3C11B	Operate in a work based team environment	2
MEM2.4C11A	Assist in the provision of on the job training	2
MEM2.5C11A	Measure with graduated devices	2
Add C12 Core points		<u>2</u>
Total Core points at C11		10

At Certificate III in Engineering – Trade/Production (C10) the Foundation units, C12 Core unit, C11 Core units and C10 Core units are required.

Unit code	Unit title	Points
MEM2.6C10A	Plan a complete activity	4
MEM2.7C10A	Perform computations – basic	2
MEM2.8C10A	Perform computations	2
MEM2.9C10A	Perform computer operations	2
Add C12 and C11 Core points		<u>10</u>
Total Core points at C10		20

Core competency units - band 2

Total of 16 points to be gained by C5 (see notes attached to qualifications above 96 points)

Unit code	Unit title	Points
MEM2.10C5A	Write reports	2
MEM2.11C5A	Research and prepare presentations and reports	2
MEM2.13C5A	Perform mathematical computations	4
MEM2.14C5A	Use graphical techniques and perform simple statistical computations	2
MEM2.15C5A	Operate in an autonomous team environment	2
MEM2.16C5A	Interpret quality specifications and manuals	4
Total Core points in band 2		16

Note 1) C12, C11, C10 & C5 refer to industrial classifications.

Note 2) Boating Services qualifications combine the *Foundation* and selected *Core* units as compulsory core for each qualification.

Attachment 4 – Boating Industry qualifications detail

MEM10203 Certificate I in Boating Services

The requirement for the awarding of a Certificate I in Boating Services is demonstrated competency in ten units of competency comprised of seven core units and three elective units. (Note: When selecting units any pre-requisite units must also be completed but can be counted towards the qualification total of twenty nine units.)

Compulsory core units (seven)

From:	Unit code	Unit title
MEM98	MEM1.1FA	Undertake interactive workplace communication
MEM98	MEM1.2FA	Apply principles of occupational health and safety in work environment
MEM98	MEM1.3FA	Apply quality procedures
MEM98	MEM1.4FA	Plan to undertake a routine task
MEM98	MEM50.1EA	Classify recreational boating technologies and features
MEM98	MEM50.2AA	Work safely on marine craft
MEM98	MEM50.3AA	Follow work procedures to maintain the marine environment

Elective units (select three)

From:	Unit code	Unit title
AUR99	AUR50318A	Dispose of waste and maintain a tidy work area
BSB01	BSBCMN212A	Handle mail
MEM98	MEM2.3C11A	Operate in a work based team environment
MEM98	MEM2.5C11B	Measure with graduated devices
MEM98	MEM9.1AA	Draw and interpret sketch
MEM98	MEM9.2AA	Interpret technical drawing
MEM98	MEM11.10AA	Operate mobile load shifting equipment
MEM98	MEM11.11AA	Perform manual handling
MEM98	MEM13.3AA	Work safely with industrial chemicals and materials
MEM98	MEM18.1AB	Use hand tools
MEM98	MEM18.2AA	Use power tools/hand held operations
MEM98	MEM50.5EA	Refuel vessels
MEM98	MEM50.6EA	Check operational capability of marine craft
MEM98	MEM50.7EA	Check operational capability of sails and sail operating equipment
MEM98	MEM50.8EA	Carry out trip preparation and planning
MEM98	MEM50.9AA	Safely operate a powered recreational boat
MEM98	MEM50.10EA	Respond to boating emergencies and incidents
PMB01	PMBHAN201A	Process orders and despatch orders
PMB01	PMBHAN202A	Load and unload goods
PRM98	PRMCL12A	Wash external surfaces to remove all visible dirt and grime
PUA00	PUAEME001A	Provide emergency care
PUA00	PUAEME002B	Manage injuries at emergency incident
PUA00	PUAEME003B	Administer oxygen in an emergency situation
SFI00	SFISHIP209A	Operate marine communications (vessel operations)
SFI00	SFISHIP212A	Take emergency action on board a vessel (vessel operations)
SRO99	SRXEMEO02A	Participate in the control of minor emergencies
THH02	THHCOR02B	Work in a socially diverse environment
THH02	THHGCS01B	Develop and update local knowledge
THH02	THHGGA03B	Source and present information
THT02	THTTCO01B	Develop and update tourism industry knowledge
WRR02	WRRCA1B	Operate retail equipment (clerical administration)
WRR02	WRRLP1B	Apply safe working practices (loss prevention)

MEM20303 Certificate II in Boating Services

The requirement for the awarding of a Certificate II in Boating Services is demonstrated competency in fifteen units of competency comprised of nine core units and six elective units. (Note: When selecting units any pre-requisite units must also be completed but can be counted towards the qualification total of twenty nine units.

Compulsory core units (nine)

From:	Unit code	Unit title
MEM98	MEM1.1FA	Undertake interactive workplace communication
MEM98	MEM1.2FA	Apply principles of occupational health and safety in work environment
MEM98	MEM1.3FA	Apply quality procedures
MEM98	MEM1.4FA	Plan to undertake a routine task
MEM98	MEM2.3C11A	Operate in a work based team environment
MEM98	MEM50.1EA	Classify recreational boating technologies and features
MEM98	MEM50.2AA	Work safely on marine craft
MEM98	MEM50.3AA	Follow work procedures to maintain the marine environment
MEM98	MEM50.4AA	Maintain quality of environment by following marina codes

Elective units (select six)

From:	Unit code	Unit title
AUR99	AUR50318A	Dispose of waste and maintain a tidy work area
AUR99	AUR18676B	Test, service and replace battery
AUR99	AUR37119A	Drive and manoeuvre trailer(s)
AUR99	AUR46335A	Launch and recover vessels from trailer
AUR99	AUR46435A	Launch and recover vessel from cranes, gantries and forklifts
AUR99	AUR46519A	Drive and manoeuvre motor driven vessels
AUR99	AUR46542A	Moor vessels
AUR99	AUR37271A	Service and repair trailers
AUR99	AUR46108A	Carry out minor hull repairs
AUR99	AUR46649A	Prepare (winterise) vessel systems
AUR99	AUR46660A	Recommission vessel systems
AUR99	AUR46749A	Prepare (winterise) engine systems
AUR99	AUR46760A	Recommission engine systems
AUR99	AUR46866A	Repair deck, hull, cabin equipment and fittings
AUR99	AUR46870A	Service deck, hull, cabin equipment and fittings
AUR99	AUR46927A	Identify the need for water testing vessels
AUR99	AUR46930A	Water test vessels
AUR99	AUR46975A	Water test engines in tanks
BSB01	BSBCMN205A	Use business technology
BSB01	BSBCMN206A	Process and maintain workplace information
BSB01	BSBCMN207A	Prepare and process financial/business documents
BSB01	BSBCMN212A	Handle mail
BSB01	BSBCMN213A	Produce simple word processed documents
MEM98	MEM2.5C11B	Measure with graduated devices
MEM98	MEM4.18AA	General woodworking machine operations
MEM98	MEM5.3AA	Soft soldering (basic)
MEM98	MEM5.5AA	Carry out mechanical cutting
MEM98	MEM5.7AB	Manual heating and thermal cutting
MEM98	MEM5.12AB	Perform routine manual metal arc welding
MEM98	MEM9.1AA	Draw and interpret sketch
MEM98	MEM9.2AA	Interpret technical drawing
MEM98	MEM11.10AA	Operate mobile load shifting equipment
MEM98	MEM11.11AA	Perform manual handling
MEM98	MEM12.6AA	Mark off/out (general engineering)
MEM98	MEM12.7AA	Mark off/out structural fabrications and shapes
MEM98	MEM13.3AA	Work safely with industrial chemicals and materials
MEM98	MEM18.1AB	Use hand tools

From:	Unit code	Unit title
MEM98	MEM18.2AA	Use power tools/hand held operations
MEM98	MEM18.3AB	Use tools for precision work
MEM98	MEM25.1AA	Apply fibre reinforced plastics
MEM98	MEM25.4AA	Fair and shape surfaces
MEM98	MEM25.7AA	Maintain marine vessel surfaces
MEM98	MEM50.5EA	Refuel vessels
MEM98	MEM50.6EA	Check operational capability of marine craft
MEM98	MEM50.7EA	Check operational capability of sails and sail operating equipment
MEM98	MEM50.8EA	Carry out trip preparation and planning
MEM98	MEM50.9AA	Safely operate a powered recreational boat
MEM98	MEM50.10EA	Respond to boating emergencies and incidents
PMB01	PMBHAN201B	Process orders and despatch orders
PMB01	PMBHAN202B	Load and unload goods
PMB01	PMBPROD315B	Produce polyurethane foam
PMB01	PMBPROD320B	Produce foam injected mouldings
PMB01	PMBPROD380B	Produce composites using chopper gun/depositor
PMB01	PMBFIN201B	Finish products and components
PMB01	PMBFIN202B	Fit attachments to products
PMB01	PMBFIN203B	Repair product imperfections
PMB01	PMBHAN204B	Package goods/materials
PMB01	PMBFIN205B	Hand decorate products
PRM98	PRMCL12A	Wash external surfaces to remove all visible dirt and grime
SFI00	SFISHIP209A	Operate marine communications (vessel operations)
SFI00	SFISHIP212A	Take emergency action on board a vessel (vessel operations)
SFI00	SFISHIP201A	Comply with organisational and legislative requirements
SFI00	SFISHIP202A	Contribute to safe navigating (vessel operations)
SFI00	SFISHIP203A	Maintain the safety and security of vessel (vessel operations)
SFI00	SFISHIP204A	Maintain marine vessels and equipment (vessel operations)
SFI00	SFISHIP205A	Maintain marine plant (vessel operations)
SFI00	SFISHIP206A	Operate a small vessel (vessel operations)
SFI00	SFISHIP207A	Operate and maintain outboard motors
SFI00	SFISHIP208A	Operate a low powered diesel engines (vessel operations)
SFI00	SFISHIP210A	Operate a marine plant and systems (vessel operations)
SFI00	SFISHIP211A	Prepare for maintenance (vessel operations)
SFI00	SFISHIP302A	Command and control manoeuvres (vessel operations)
SFI00	SFISHIP303A	Initial response to navigation emergencies (vessel operations)
SFI00	SFISHIP306A	Monitor and control navigation in an inshore area
PUA00	PUAEME001A	Provide emergency care
PUA00	PUAEME002B	Manage injuries at emergency incident
PUA00	PUAEME003B	Administer oxygen in an emergency situation
PUA00	PUAOPE002A	Operate communications systems and equipment
SRO99	SRXEMEO02A	Participate in the control of minor emergencies
SRO99	SROOPS001A	Implement minimal environmental impact practices
SRO99	SROOPS002A	Plan for minimal environmental impact
SRO99	SROOPS003A	Apply weather information
SRO99	SROOPS006A	Use and maintain a temporary overnight site
SRO99	SROORE001A	Prepare to participate in a supervised outdoor activity requiring basic skills
SRO99	SROORE002A	Participate in a supervised outdoor activity requiring basic skills
SRO99	SROORE003A	Prepare to participate in outdoor activities
SRO99	SROORE004A	Participate in outdoor activities
SRO99	SROYAC001A	Comply with maritime rules and regulations
SRO99	SROYSB001A	Use basic skills to sail a small boat in controlled conditions
SRO99	SRXEME003A	Respond to emergency situations
SRO99	SROOPS005A	Apply search and rescue skills
SRO99	SROYAC002A	Crew a ballasted yacht inshore
SRO99	SROYMC001A	Crew a motor cruiser inshore
SRO99	SROYSB002A	Sail a small boat in light to moderate conditions using enhanced skills
SRO99	SRXEME004A	Coordinate emergency response

From:	Unit code	Unit title
SRO99	SRXRES002A	Improve client awareness and implementation of environmental management practices
SRO99	SRXRES004A	Minimise waste and pollution and their environmental impact
SRO99	SRXRES008A	Conserve and re-establish natural systems
THH02	THHCOR02B	Work in a socially diverse environment
THH02	THHGCS01B	Develop and update local knowledge
THH02	THHGGA03B	Source and present information
THT02	THTTCO01B	Develop and update tourism industry knowledge
WRR02	WRRCA1B	Operate retail equipment (clerical administration)
WRR02	WRR1B	Perform stock control procedures (inventory)
WRR02	WRRLP1B	Apply safe working practices (loss prevention)
WRR02	WRRF1B	Balance register/terminal (finance)
WRR02	WRRF2B	Perform retail finance duties (finance)
WRR02	WRRCS2B	Apply point of sale handling procedures (service)
WRR02	WRRCS3B	Interact with customers
WRR02	WRR12B	Minimise theft (loss prevention)
WRR02	WRRLP6C	Apply retail food safety practices
WRR02	WRRM1B	Merchandise products (merchandising)
WRR02	WRRM2B	Perform routine housekeeping duties
WRR02	WRRS1B	Sell product and services (selling)
WRR02	WRRS2B	Advise on products and services (selling)

MEM30703 Certificate III in Boating Services

The requirement for the awarding of a Certificate III in Boating Services is demonstrated competency in twenty three units of competency comprised of nine core units and fourteen elective units. (Note: When selecting units any pre-requisite units must also be completed but can be counted towards the qualification total of twenty nine units.)

Compulsory core units (nine)

From:	Unit code	Unit title
MEM98	MEM1.1FA	Undertake interactive workplace communication
MEM98	MEM1.2FA	Apply principles of occupational health and safety in work environment
MEM98	MEM1.3FA	Apply quality procedures
MEM98	MEM1.4FA	Plan to undertake a routine task
MEM98	MEM2.3C11A	Operate in a work based team environment
MEM98	MEM50.1EA	Classify recreational boating technologies and features
MEM98	MEM50.2AA	Work safely on marine craft
MEM98	MEM50.3AA	Follow work procedures to maintain the marine environment
MEM98	MEM50.4AA	Maintain quality of environment by following marina codes

Elective units (select fourteen)

From:	Unit code	Unit title
AUR99	AUR18676B	Test, service and replace battery
AUR99	AUR37119A	Drive and manoeuvre trailer(s)
AUR99	AUR37271A	Service and repair trailers
AUR99	AUR46108A	Carry out minor hull repairs
AUR99	AUR46335A	Launch and recover vessels from trailer
AUR99	AUR46435A	Launch and recover vessel from cranes, gantries and forklifts
AUR99	AUR46519A	Drive and manoeuvre motor driven vessels
AUR99	AUR46542A	Moor vessels
AUR99	AUR46649A	Prepare (winterise) vessel systems
AUR99	AUR46660A	Recommission vessel systems
AUR99	AUR46749A	Prepare (winterise) engine systems
AUR99	AUR46760A	Recommission engine systems
AUR99	AUR46866A	Repair deck, hull, cabin equipment and fittings
AUR99	AUR46870A	Service deck, hull, cabin equipment and fittings
AUR99	AUR46927A	Identify the need for water testing vessels
AUR99	AUR46930A	Water test vessels
AUR99	AUR46975A	Water test engines in tanks
AUR99	AUR50318A	Dispose of waste and maintain a tidy work area
BSB01	BSBCMN205A	Use business technology
BSB01	BSBCMN206A	Process and maintain workplace information
BSB01	BSBCMN207A	Prepare and process financial/business documents
BSB01	BSBCMN212A	Handle mail
BSB01	BSBCMN213A	Produce simple word processed documents
BSB01	BSBCMN306A	Produce business documents
BSB01	BSBCMN308A	Maintain financial records
BSB01	BSBADM308A	Process payroll
MEM98	MEM2.5C11B	Measure with graduated devices
MEM98	MEM4.18AA	General woodworking machine operations
MEM98	MEM5.3AA	Soft soldering (basic)
MEM98	MEM5.5AA	Carry out mechanical cutting
MEM98	MEM5.7AB	Manual heating and thermal cutting
MEM98	MEM5.12AB	Perform routine manual metal arc welding
MEM98	MEM9.1AA	Draw and interpret sketch
MEM98	MEM9.2AA	Interpret technical drawing
MEM98	MEM11.10AA	Operate mobile load shifting equipment
MEM98	MEM11.11AA	Perform manual handling
MEM98	MEM12.6AA	Mark off/out (general engineering)

From:	Unit code	Unit title
MEM98	MEM12.7AA	Mark off/out structural fabrications and shapes
MEM98	MEM13.3AA	Work safely with industrial chemicals and materials
MEM98	MEM18.1AB	Use hand tools
MEM98	MEM18.2AA	Use power tools/hand held operations
MEM98	MEM18.3AB	Use tools for precision work
MEM98	MEM25.1AA	Apply fibre reinforced plastics
MEM98	MEM25.4AA	Fair and shape surfaces
MEM98	MEM25.7AA	Maintain marine vessel surfaces
MEM98	MEM25.8AA	Repair marine vessel surfaces and structures
MEM98	MEM50.5EA	Refuel vessels
MEM98	MEM50.6EA	Check operational capability of marine craft
MEM98	MEM50.7EA	Check operational capability of sails and sail operating equipment
MEM98	MEM50.8EA	Carry out trip preparation and planning
MEM98	MEM50.9AA	Safely operate a powered recreational boat
MEM98	MEM50.10EA	Respond to boating emergencies and incidents
PMB01	PMBHAN201B	Process orders and despatch orders
PMB01	PMBHAN202B	Load and unload goods
PMB01	PMBPROD315B	Produce polyurethane foam
PMB01	PMBPROD320B	Produce foam injected mouldings
PMB01	PMBPROD380B	Produce composites using chopper gun/depositor
PMB01	PMBFIN201B	Finish products and components
PMB01	PMBFIN202B	Fit attachments to products
PMB01	PMBFIN203B	Repair product imperfections
PMB01	PMBHAN204B	Package goods/materials
PMB01	PMBFIN205B	Hand decorate products
PRM98	PRMCL12A	Wash external surfaces to remove all visible dirt and grime
SFI00	SFISHIP201A	Comply with organisational and legislative requirements
SFI00	SFISHIP202A	Contribute to safe navigating (vessel operations)
SFI00	SFISHIP203A	Maintain the safety and security of vessel (vessel operations)
SFI00	SFISHIP204A	Maintain marine vessels and equipment (vessel operations)
SFI00	SFISHIP205A	Maintain marine plant (vessel operations)
SFI00	SFISHIP206A	Operate a small vessel (vessel operations)
SFI00	SFISHIP207A	Operate and maintain outboard motors
SFI00	SFISHIP208A	Operate a low powered diesel engines (vessel operations)
SFI00	SFISHIP209A	Operate marine communications (vessel operations)
SFI00	SFISHIP210A	Operate a marine plant and systems (vessel operations)
SFI00	SFISHIP211A	Prepare for maintenance (vessel operations)
SFI00	SFISHIP212A	Take emergency action on board a vessel (vessel operations)
SFI00	SFISHIP302A	Command and control manoeuvres (vessel operations)
SFI00	SFISHIP303A	Initial response to navigation emergencies (vessel operations)
SFI00	SFISHIP304A	Manage the operation of auxiliaries and service plant outside normal parameters (vessel operations)
SFI00	SFISHIP305A	Manage the operation of low powered marine diesel engines outside normal parameters (vessel operations)
SFI00	SFISHIP306A	Monitor and control navigation in an inshore area
SFI00	SFISHIP307A	Plan maintenance for marine engineering systems (vessel operations)
SFI00	SFISHIP401A	Ensure the seaworthiness of the vessel (simplified stability criteria)
SFI00	SFISHIP403A	Monitor and control search and rescue operations
PUA00	PUAEME001A	Provide emergency care
PUA00	PUAEME002B	Manage injuries at emergency incident
PUA00	PUAEME003B	Administer oxygen in an emergency situation
PUA00	PUAOPE002A	Operate communications systems and equipment
SRO99	SROOPS001A	Implement minimal environmental impact practices
SRO99	SROOPS002A	Plan for minimal environmental impact
SRO99	SROOPS003A	Apply weather information
SRO99	SROOPS005A	Apply search and rescue skills
SRO99	SROOPS006A	Use and maintain a temporary overnight site
SRO99	SROORE001A	Prepare to participate in a supervised outdoor activity requiring basic

From:	Unit code	Unit title
		skills
SRO99	SROORE002A	Participate in a supervised outdoor activity requiring basic skills
SRO99	SROORE003A	Prepare to participate in outdoor activities
SRO99	SROORE004A	Participate in outdoor activities
SRO99	SROYAC001A	Comply with maritime rules and regulations
SRO99	SROYAC002A	Crew a ballasted yacht inshore
SRO99	SROYAC003A	Skipper a ballasted yacht inshore
SRO99	SROYMC001A	Crew a motor cruiser inshore
SRO99	SROYMC002A	Skipper a motor cruiser inshore
SRO99	SROYSB001A	Use basic skills to sail a small boat in controlled conditions
SRO99	SROYSB002A	Sail a small boat in light to moderate conditions using enhanced skills
SRO99	SRXEMEO02A	Participate in the control of minor emergencies
SRO99	SRXEME003A	Respond to emergency situations
SRO99	SRXEME004A	Coordinate emergency response
SRO99	SRXRES002A	Improve client awareness and implementation of environmental management practices
SRO99	SRXRES004A	Minimise waste and pollution and their environmental impact
SRO99	SRXRES008A	Conserve and re-establish natural systems
THH02	THHCOR02B	Work in a socially diverse environment
THH02	THHGCS01B	Develop and update local knowledge
THH02	THHGGA03B	Source and present information
THH02	THTSMA01B	Coordinate the production of brochures and marketing materials
THT02	THTTTCO01B	Develop and update tourism industry knowledge
WRR02	WRRCA1B	Operate retail equipment (clerical administration)
WRR02	WRRCA5B	Operate retail information technology systems
WRR02	WRRCS2B	Apply point of sale handling procedures (service)
WRR02	WRRCS3B	Interact with customers
WRR02	WRRF1B	Balance register/terminal (finance)
WRR02	WRRF2B	Perform retail finance duties (finance)
WRR02	WRR11B	Perform stock control procedures (inventory)
WRR02	WRR15A	Maintain and order stock
WRR02	WRR1P1B	Apply safe working practices (loss prevention)
WRR02	WRR12B	Minimise theft (loss prevention)
WRR02	WRR1P3B	Maintain store safety (loss prevention)
WRR02	WRR1P6C	Apply retail food safety practices
WRR02	WRRM1B	Merchandise products (merchandising)
WRR02	WRRM2B	Perform routine housekeeping duties
WRR02	WRRS1B	Sell product and services (selling)
WRR02	WRRS2B	Advise on products and services (selling)

MEM40203 Certificate IV in Boating Services

The requirement for the awarding of a Certificate IV in Boating Services is demonstrated competency in twenty nine units of competency comprised of nine core units and twenty elective units. (Note: When selecting units any pre-requisite units must also be completed but can be counted towards the qualification total of twenty nine units.)

Compulsory core units (nine)

From	Unit code	Unit title
MEM98	MEM1.1FA	Undertake interactive workplace communication
MEM98	MEM1.2FA	Apply principles of occupational health and safety in work environment
MEM98	MEM1.3FA	Apply quality procedures
MEM98	MEM1.4FA	Plan to undertake a routine task
MEM98	MEM2.3C11A	Operate in a work based team environment
MEM98	MEM50.1EA	Classify recreational boating technologies and features
MEM98	MEM50.2AA	Work safely on marine craft
MEM98	MEM50.3AA	Follow work procedures to maintain the marine environment
MEM98	MEM50.4AA	Maintain quality of environment by following marina codes

Elective units (twenty)

Select twenty units from the groups of elective units below, with:

- at least one unit from the list below, and

From:	Unit code	Unit title
MEM98	MEM50.5EA	Refuel vessels
MEM98	MEM50.6EA	Check operational capability of marine craft
MEM98	MEM50.7EA	Check operational capability of sails and sail operating equipment
MEM98	MEM50.8EA	Carry out trip preparation and planning
MEM98	MEM50.9AA	Safely operate a mechanically powered recreational boat
MEM98	MEM50.10EA	Respond to boating emergencies and incidents

- at least five units from the list below, and

From:	Unit code	Unit title
BSB01	BSBCMN408A	Report on financial activity
BSB01	BSBRKG301A	Control records
BSB01		any units from BSB41001 Certificate IV in Business (Frontline Management)
BSB01	BSBADM402A	Produce complex business documents
BSB01	BSBCMN406A	Maintain business technology
BSB01		any units from BSZ40198 Certificate IV in Assessment and Workplace Training
SFI00	SFISHIP501A	Control overall safety of navigation operations (vessel operations)
SFI00	SFISHIP502A	Ensure the seaworthiness of the vessel
SFI00	SFISHIP503A	Prepare and plan the voyage (vessel operations)
FNB99	FNBFIN71A	Prepare financial reports to meet statutory requirements

- the balance to be selected from the list below

From:	Unit code	Unit title
AUR99	AUR37271A	Service and repair trailers
AUR99	AUR46108A	Carry out minor hull repairs
AUR99	AUR46649A	Prepare (winterise) vessel systems
AUR99	AUR46660A	Recommission vessel systems
AUR99	AUR46749A	Prepare (winterise) engine systems
AUR99	AUR46760A	Recommission engine systems
AUR99	AUR46866A	Repair deck, hull, cabin equipment and fittings
AUR99	AUR46870A	Service deck, hull, cabin equipment and fittings
AUR99	AUR46927A	Identify the need for water testing vessels

From:	Unit code	Unit title
AUR99	AUR46930A	Water test vessels
AUR99	AUR46975A	Water test engines in tanks
BSB01	BSBCMN308A	Maintain financial records
BSB01	BSBADM308A	Process payroll
BSB01	BSBCMN206A	Process and maintain workplace information
BSB01	BSBCMN306A	Produce business documents
BSB01	BSBCMN205A	Use business technology
BSB01	BSBCMN408A	Report on financial activity
BSB01	BSBRKG301A	Control records
BSB01	BSBADM402A	Produce complex business documents
BSB01	BSBCMN406A	Maintain business technology
BSB01		any units from BSB4101 Certificate IV in Business (Frontline Management)
BSB01		any units from BSZ40198 Certificate IV in Assessment and Workplace Training
FNB99	FNBFIN71A	Prepare financial reports to meet statutory requirements
MEM98	MEM4.18AA	General woodworking machine operations
MEM98	MEM5.3AA	Soft soldering (basic)
MEM98	MEM5.5AA	Carry out mechanical cutting
MEM98	MEM5.7AB	Manual heating and thermal cutting
MEM98	MEM5.12AB	Perform routine manual metal arc welding
MEM98	MEM25.1AA	Apply fibre reinforced materials
MEM98	MEM25.4AA	Fair and shape surfaces
MEM98	MEM25.7AA	Maintain marine vessel surfaces
MEM98	MEM25.8AA	Repair marine vessel surfaces and structures
SFI00	SFISHIP302A	Command and control manoeuvres (vessel operations)
SFI00	SFISHIP303A	Initial response to navigation emergencies (vessel operations)
SFI00	SFISHIP306A	Monitor and control navigation in an inshore area
SFI00	SFISHIP304A	Manage the operation of auxiliaries and service plant outside normal parameters (vessel operations)
SFI00	SFISHIP305A	Manage the operation of low powered marine diesel engines outside normal parameters (vessel operations)
SFI00	SFISHIP307A	Plan maintenance for marine engineering systems (vessel operations)
SFI00	SFISHIP401A	Ensure the seaworthiness of the vessel (simplified stability criteria)
SFI00	SFISHIP403A	Monitor and control search and rescue operations
SFI00	SFISHIP501A	Control overall safety of navigation operations (vessel operations)
SFI00	SFISHIP502A	Ensure the seaworthiness of the vessel
SFI00	SFISHIP503A	Prepare and plan the voyage (vessel operations)
SRO99	SROOPS005A	Apply search and rescue skills
SRO99	SROYAC002A	Crew a ballasted yacht inshore
SRO99	SROYMC001A	Crew a motor cruiser inshore
SRO99	SROYSB002A	Sail a small boat in light to moderate conditions using enhanced skills
SRO99	SRXEME004A	Coordinate emergency response
SRO99	SRXRES002A	Improve client awareness and implementation of environmental management practices
SRO99	SRXRES004A	Minimise waste and pollution and their environmental impact
SRO99	SRXRES008A	Conserve and re-establish natural systems
SRO99	SROYAC003A	Skipper a ballasted yacht inshore
SRO99	SROYMC002A	Skipper a motor cruiser inshore
WRR02	WRRCA5B	Operate retail information technology systems
WRR02	WRR15A	Maintain and order stock
WRR02	WRRLP3B	Maintain store safety (loss prevention)
WRR02	WRRO1B	Manage merchandise and store presentation (merchandising)
WRR02	WRRO2B	Manage sales and service delivery (operations)
WRR02	WRRO3B	Provide a safe working environment (operations)
WRR02	WRRO4B	Control store security/loss (operations)
WRR02	WRRO5B	Control inventory (operations)

From:	Unit code	Unit title
WRR02	WRRO6B	Manage store facilities (operations)

Persons holding any of the following qualifications are recognised as having credit in a substantial part of the Certificate IV in Boating Services:

Certificate III in Marine Craft Construction – MEM30603

Certificate III in Marine (Installation) – AUR32199

Certificate III in Marine (Mechanics) – AUR32299

Certificate III in Marine (Sales) – AUR32399

Certificate III in Textile Fabrication – LMT30400

In addition to their Certificate III qualification, they need only complete eight additional units as specified below.

Compulsory core unit (one)

From:	Unit code	Unit title
MEM98	MEM50.1EA	Classify recreational boating technologies and features

Elective units (seven)

- one unit from the list below, and

From:	Unit code	Unit title
MEM98	MEM50.2AA	Work safely on marine craft
MEM98	MEM50.3AA	Follow work procedures to maintain the marine environment
MEM98	MEM50.4AA	Maintain quality of environment by following marina codes
MEM98	MEM50.5EA	Refuel vessels
MEM98	MEM50.6EA	Check operational capability of marine craft
MEM98	MEM50.7EA	Check operational capability of sails and sail operating equipment
MEM98	MEM50.8EA	Carry out trip preparation and planning
MEM98	MEM50.9AA	Safely operate a mechanically powered recreational boat
MEM98	MEM50.10EA	Respond to boating emergencies and incidents

- six units from the list below.

From:	Unit code	Unit title
BSB01	BSBCM408A	Report on financial activity
BSB01	BSBRKG301A	Control records
BSB01		any units from BSB4101 Certificate IV in Business (Frontline Management)
BSB01	BSBADM402A	Produce complex business documents
BSB01	BSBCM406A	Maintain business technology
BSB01		any units from BSZ40198 Certificate IV in Assessment and Workplace Training
SFI00	SFISHIP501A	Control overall safety of navigation operations (vessel operations)
SFI00	SFISHIP502A	Ensure the seaworthiness of the vessel
SFI00	SFISHIP503A	Prepare and plan the voyage (vessel operations)
FNB99	FNBFIN71A	Prepare financial reports to meet statutory requirements

MEM30603 Certificate III in Marine Craft Construction

As indicated in the earlier section of the Metal and Engineering Training Package qualifications, this qualification follows the same packaging rules as apply to the Engineering Certificate III 'Trade' qualifications (compulsory *Foundation* and *Core* units, plus 40 points of Stream units, plus 36 points of Specialisation elective units). The requirement for the awarding of a Certificate III in Marine Craft Construction is demonstrated competency in units to a minimum points value of 96 according to the following structure:

Compulsory units (20 points)

Unit code	Unit title	Points
MEM1.1FA	Undertake interactive workplace communication	0
MEM1.2FA	Apply principles of Occupational Health & Safety (OH&S) in work environment	0
MEM1.3FA	Apply quality procedures	0
MEM1.4FA	Plan to undertake a routine task	0
MEM2.1C12A	Apply quality systems	2
MEM2.2C11A	Organise and analyse information	2
MEM2.3C11A	Operate in a work based team environment	2
MEM2.4C11A	Assist in the provision of on the job training	2
MEM2.5C11B	Measure with graduated devices	2
MEM2.6C10A	Plan a complete activity	4
MEM2.7C10A	Perform computations – basic	2
MEM2.8C10A	Perform computations	2
MEM2.9C10A	Perform computer operations	2

Stream units - select 40 points in units drawn from the Marine Craft Construction units stream Specialisation band A units as follows (pre-requisite units points value may be included in the 40 'stream' points):

Unit code	Unit title	Points
MEM4.18AB	General woodworking machine operations	4
MEM8.11AA	Undertake surface preparation using solvents and/or mechanical means	2
MEM8.14AA	Apply protective coatings (basic)	4
MEM9.21AA	Interpret and produce curved 3-dimensional shapes	4
MEM10.13A	Assemble and install equipment and accessories/ancillaries	2
MEM12.7AA	Mark off/out structural fabrications and shapes	4
MEM25.1AA	Apply fibre-reinforced materials	2
MEM25.2AA	Form and integrate fibre-reinforced structures	4
MEM25.3AA	Set up marine vessel structures	4
MEM25.4AA	Fair and shape surfaces	2
MEM25.5AA	Construct and assemble marine vessel timber components	8
MEM25.6AA	Undertake marine sheathing operations	2
MEM25.7AA	Maintain marine vessel surfaces	4
MEM25.8AA	Repair marine vessel surfaces and structures	4
MEM25.9AA	Form timber shapes using hot processes	2
MEM25.10AA	Perform fitout procedures	4
MEM25.11AA	Install marine systems	8
MEM25.12AA	Install and test operations of marine auxiliary systems	6
MEM25.13AA	Produce three dimensional plugs/moulds	12
MEM25.14AA	Perform marine slipping operations	2
MEM50.2AA	Work safely on marine craft	1
MEM50.3AA	Follow work procedures to maintain the marine environment	1
MEM50.4AA	Maintain quality of environment by following marine codes	1
MEM50.9AA	Safely operate powered recreational boat	2

Specialisation electives units (select 36 points in units drawn from MEM98 *Specialisation* band A units (including dual band A/band B units). Note that pre-requisite units points value may be included in the 36 points for electives.

Metal and Engineering Training Package

National code identifier – MEM98

Introduction to the Competency Standards

**for the manufacturing and
engineering industry**

MERSITAB



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10 Eagle Street
BRISBANE, QLD 4000
Phone: (07) 3246 2300 Fax: (07) 3246 2490

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Published by: Australian Training Products Ltd
Level 25, 150 Lonsdale St
Melbourne 3000
Phone: +61 3 96550600 Fax: +61 3 9639 4684
www.atpl.net.au e-mail: sales@atpl.net.au

First published: November 1998

Stock Code Number: 5040008S

ISBN: 0 642 79928 8

MEM98 Metals & Engineering Training Package – Volume One

Printed by: Document Printing Australia Pty Ltd

AESharenet Code: P

Print Version No: 4

20 August 2003

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Modification History

MODIFICATION HISTORY – ENDORSED MATERIALS			
Please refer to the National Training Information Service for the latest version of Units of Competency and Qualification information (http://www.ntis.gov.au).			
MEM98 Metal and Engineering Training Package			Sheet: 1 of 1
Version	Date of Release	Authorisation:	Comments
4	20/08/03	NTQC	Inclusion of Marine Craft Construction, Boating Services and Jewellery Manufacture resulting in five new qualifications. Revised name of Certificate IV in Engineering, introduction of new and revised units as listed in the details table.
3.00	10/02/03	NTQC	Revised point weighting and introduction of new units as listed in following details table
2.00	01/12/99	NTFC	Details not available
1.00	21/11/98	NTFC	Primary Release
			Pre Training package, standards originally published 1995

Details Table

Unit code	V	Unit title	Change information	P
1. Foundation units				
MEM1.2F	A	Apply principles of Occupational Health and Safety in work environment	<i>minor title change</i>	0
2. Core units				
MEM2.7C10	A	Perform computations – basic	<i>minor title change</i>	2
4. Casting and moulding				
MEM4.9A	B	Inspect/test castings/forgings	<i>pre-requisite correction</i>	6
MEM4.16A	B	Develop and manufacture precision models	<i>pre-requisite correction</i>	6
5. Fabrication				
MEM5.38A	A	Advanced geometric development – Cylindrical/Rectangular	<i>minor title change</i>	2
MEM5.39A	A	Advanced geometric development –	<i>minor title change</i>	2

National Metal and Engineering Industry Competency Standards

Unit code	V	Unit title	Change information	P
		Conical		
MEM5.40A	A	Advanced geometric development – Transitions	<i>minor title change</i>	4
MEM5.49A	B	Perform routine gas tungsten arc welding	<i>elements, assessor guide</i>	2
6. Forging				
MEM6.6A	B	Spring repair	<i>pre-requisite correction</i>	4
7. Machine and process operations				
MEM7.15A	A	Set NC/CNC machines/process (basic)	<i>minor title correction</i>	2
MEM7.16A	B	**Set and edit NC/CNC machine/process	<i>path 4 deleted</i>	4
MEM7.18A	B	**Basic NC/CNC programming	<i>path 4 deleted</i>	4
MEM7.19A	B	**Program NC/CNC machining centre	<i>path 4 deleted</i>	2
MEM7.20A	B	**Program multiple spindle and/or multiple axis NC/CNC machining centre	<i>path 4 deleted</i>	2
MEM7.22A	B	**Advanced programming of CNC wire cut machines	<i>path 4 deleted</i>	2
MEM7.23B	B	Program and set up CNC manufacturing cell	<i>path 4 deleted</i>	6
MEM7.30A	B	Perform metal spinning lathe operations (basic)	<i>pre-requisite removed</i>	6
MEM7.31A	B	Perform metal spinning lathe operations (complex)	<i>pre-requisite removed</i>	4
8. Surface Finishing				
MEM8.2A	B	Pre-treat work for subsequent surface coating	<i>range statement</i>	4
MEM8.3A	B	Finish work using acidic/alkaline electroplating solutions	<i>all components of unit, points</i>	6
MEM8.5A	A	Prepare and produce specialised coatings electrolytically	<i>title correction</i>	4
MEM8.9A	B	Maintain basic solutions	<i>title, element, range statement</i>	2
MEM8.18A	A	Electroplate engineering coatings	<i>new unit</i>	6
MEM8.19A	A	Electroplate protective finishes	<i>new unit</i>	6
MEM8.20A	A	Electroplate decorative finishes	<i>new unit</i>	6
9 Drawing, drafting and design				
MEM9.21A	A	Interpret and produce curved 3-dimensional shapes	<i>new unit</i>	4
10. Installation and commissioning				
MEM10.3A	A	Install and test electrical wiring and circuits (up to 1000vAC/1500vDC)	<i>minor title change</i>	8
MEM10.7B	B	Modification of control systems	<i>pre-requisites and pathways corrected</i>	6
MEM10.13A	A	Assemble and install equipment and accessories/ancillaries	<i>new unit</i>	2

National Metal and Engineering Industry Competency Standards

Unit code	V	Unit title	Change information	P
12. Measurement				
MEM12.7A	B	Mark off/out structural fabrications and shapes	<i>element, range statement</i>	4
13. Occupational Health and Safety				
MEM13.2A	A	Undertake Occupational Health & Safety activities in the workplace	<i>minor title change</i>	3
MEM13.5B	A	Manage Occupational Health & Safety for a workplace or section of a workplace	<i>minor title change</i>	12
MEM13.6A	A	Monitor Occupational Health & Safety factors for an enterprise or section of an enterprise	<i>minor title change</i>	4
15. Quality				
MEM15.20B	B	Perform verification/certification or in-service inspection	<i>pre-requisite corrected</i>	12
MEM15.21B	B	Conduct audits of servicing licensees and public weighbridge licensees	<i>pre-requisite corrected</i>	4
18. Maintenance and diagnostics				
MEM18.10A	B	*Equipment condition monitoring and recording	<i>pre-requisites removed</i>	4
MEM18.17B	B	Modify mechanical system and equipment	<i>minor title change, pre-requisite removed</i>	8
MEM18.45A	A	Fault find/repair electrical equipment/components which use up to 240v single phase supply	<i>minor title change</i>	4
MEM18.46A	A	Fault find/repair electrical equipment/components which use up to 1000vAC/1500vDC	<i>minor title change</i>	6
MEM18.49A	A	**Disconnect/reconnect fixed wired equipment which use up to 1000vAC/1500vDC	<i>minor title change</i>	3
MEM18.58A	B	*Modify electronic equipment	<i>range statement</i>	4
MEM18.60A	A	*Maintain, repair control instrumentation - single and multiple loop control systems	<i>minor title change</i>	8
MEM18.70B	B	Modify complex electrical circuits and systems	<i>pre-requisite correction</i>	6
19. Jewellery and horological				
MEM19.9A	A	Perform investment procedures for "lost wax" casting process	<i>minor title change</i>	1
MEM19.10A	A	Produce rubber moulds for "lost wax" casting process	<i>minor title change</i>	2
MEM19.11A	A	Perform wax injection of moulds for "lost wax" casting process	<i>minor title change</i>	2
MEM19.16A	A	Construct jewellery components	<i>new unit</i>	4
MEM19.17A	A	Fabricate jewellery items	<i>new unit</i>	6
MEM19.18A	A	*Repair jewellery items	<i>new unit</i>	6
MEM19.20A	A	Fault-find and maintain micro-mechanisms	<i>new unit</i>	4

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Unit code	V	Unit title	Change information	P
MEM19.21A	A	Diagnose and service micro-mechanisms	<i>new unit</i>	6
MEM19.22A	A	*Perform precision micro-mechanism diagnosis and servicing	<i>new unit</i>	6
25. Marine craft construction				
MEM25.1A	A	Apply fibre-reinforced materials	<i>new unit</i>	2
MEM25.2A	A	Form and integrate fibre-reinforced structures	<i>new unit</i>	4
MEM25.3A	A	Set up marine vessel structures	<i>new unit</i>	4
MEM25.4A	A	Fair and shape surfaces	<i>new unit</i>	2
MEM25.5A	A	Construct and assemble marine vessel timber components	<i>new unit</i>	8
MEM25.6A	A	Undertake marine sheathing operations	<i>new unit</i>	2
MEM25.7A	A	Maintain marine vessel surfaces	<i>new unit</i>	4
MEM25.8A	A	Repair marine vessel surfaces and structures	<i>new unit</i>	4
MEM25.9A	A	Form timber shapes using hot processes	<i>new unit</i>	2
MEM25.10A	A	Perform fitout procedures	<i>new unit</i>	4
MEM25.11A	A	Install marine systems	<i>new unit</i>	8
MEM25.12A	A	Install and test operations of marine auxiliary systems	<i>new unit</i>	6
MEM25.13A	A	*Produce three dimensional plugs/moulds	<i>new unit</i>	12
MEM25.14A	A	Perform marine slipping operations	<i>new unit</i>	2
50. Boating services				
MEM50.1E	A	Classify recreational boating technologies and features	<i>new unit</i>	n/a
MEM50.2A	A	Work safely on marine craft	<i>new unit</i>	1
MEM50.3A	A	Follow work procedures to maintain the marine environment	<i>new unit</i>	1
MEM50.4A	A	Maintain quality of environment by following marina codes	<i>new unit</i>	1
MEM50.5E	A	Refuel vessels	<i>new unit</i>	n/a
MEM50.6E	A	Check operational capability of marine craft	<i>new unit</i>	n/a
MEM50.7E	A	Check operational capability of sails and sail operating equipment	<i>new unit</i>	n/a
MEM50.8E	A	Carry out trip preparation and planning	<i>new unit</i>	n/a
MEM50.9A	A	Safely operate a mechanically powered recreational boat	<i>new unit</i>	2
MEM50.10E	A	Respond to boating emergencies and incidents	<i>new unit</i>	n/a

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1. Introduction

These competency standards have been produced by the Manufacturing, Engineering and Related Services Industry Training Advisory Body Ltd. (MERS ITAB) for the manufacturing, metal and engineering industry. The units printed in these volumes cover the Metal and Engineering Training Package qualifications from Certificate I to Diploma. They also satisfy Metal, Engineering and Associated Industries Award classification levels C12 to C5.

Each page of each competency standards unit is uniquely identified by a unit number, page number and version date. The unit numbers now include 'MEM' indicating that they can form part of the Metal and Engineering Training Package and they also include a version identifier (version 'A' is November 1998 – see page 6 for more details).

A brief description of the structure and use of the standards is included after this introduction and further details on how they should be used for training purposes are shown in the Metal and Engineering Training Package Policy Document. For industrial classification purposes, please refer to the Implementation Guide, a separate document agreed by the industry parties.

These competency standards are subject to continuous review and maintenance. In particular the review will focus on any new or significantly revised units. In all cases, all aspects of the units are subject to review including their technical adequacy, scope and application, and points weighting. The review process will be dealt with on a cyclical basis, with the frequency determined by the extent of any proposed change.

MERS ITAB has an established Metal and Engineering Competency Standards Review Group comprised of key industry stakeholders and ITAB staff. The group considers all feedback on the standards and changes are made where appropriate. Feedback and comment is sought from enterprises, industry organisations and training organisations from across Australia.

If you have any queries about the standards or their use, or any feedback, please contact MERS ITAB, the Australian Industry Group or the members of the Metal Trades Federation of Unions for further information.

Note that the points weightings for the electrical/electronic units are being reviewed as part of the Phase II Training Package Review 2002-3.

2. Brief description of the standards structure

This section provides information on:

- what the standards are
- the standards model
 - the fields
 - the Core and Specialisation competencies
- the format of individual competency standards
- how the standards may be applied.

What are competency standards?

National competency standards are a set of competency descriptions. The competency descriptions are called units and describe the level of skill and the depth of knowledge required to work competently at the various skill levels required by the industry.

These standards focus on what is expected of people in workplaces rather than on the learning process. The standards reflect realistic workplace practices across a broad range of situations. This includes the specification of knowledge and skills and the application of that knowledge and skill in the workplace as well as the ability to transfer and apply the competency in new situations, environments and contexts.

The National Metal and Engineering Competency Standards are a basis for the development of learning strategies for training programs as well as workplace recognition of skills. These standards have been endorsed by the National Training Quality Council (NTQC) of the Australian National Training Authority.

The standards framework

The framework used to develop competency standards for the metal and engineering industry is designed to facilitate flexibility and multiskilling as well as specialisation. It is based on the principle that individual units of competency, apart from the very small number of *Core* units, should not be exclusively related to a particular occupation or classification level.

For example, the competency unit 'interpret technical drawing' is available to all employees on a needs basis and is not exclusive to workers in the drafting areas. Similarly, the unit 'perform lathe operations' is not restricted to engineering tradespersons. Choices are, of course, subject to satisfaction of any skill prerequisites.

The 'fields'

The competency standards are divided into 'fields' as convenient groupings of units to assist the organisation of the standards and to help users in the selection of relevant competency standards units. The fields do not set up barriers to accessing any competency units in a field, or between fields.

The competency standards and fields are divided into three categories:

- *Foundation* units (field 1)
- *Core* units (field 2)
- *Specialisation* units (fields 3 onwards)

The following field numbers, groupings and titles have been used:

- 1 Foundation
- 2 Core
- 3 Assembly
- 4 Casting and moulding
- 5 Fabrication
- 6 Forging
- 7 Machine and process operations
- 8 Surface finishing
- 9 Drawing, drafting and design
- 10 Installation and commissioning
- 11 Materials handling
- 12 Measurement
- 13 Occupational health and safety
- 14 Planning
- 15 Quality
- 16 Communication
- 17 Training
- 18 Maintenance and diagnostics
- 19 Jewellery and horological
- 24 Non-destructive testing
- 25 Marine craft construction
- 50 Boating services

Types of competency standards

Foundation units

Foundation units describe competencies that are a necessary part of the skill profile of every job in the industry. *Foundation* competencies do not carry a points weighting, however they are necessary prerequisites to higher level units and will form part of the skills profile of all employees. Weighting points are explained further on in this document.

These units of competency should be achieved through a combination of secondary school education, induction training within an enterprise, and up to three months structured training required under the Award definition for C13. *Foundation* units are not subject to formal assessment for reclassification purposes.

Core units

The *Core* units define competencies that are common and necessary across a range of classifications and positions in the Metal and Engineering Industry. *Core* units have been fixed for Industrial Award Classifications C12, C11, C10, and the C9-C5 classification range as well as for each corresponding Training Package qualification. *Core* unit requirements for a particular level must be satisfied before progression to a higher classification or qualification level. The Key Competencies have been mapped against the *Foundation* and *Core* units and achievement of the Metal and Engineering units will also provide recognition in the Key Competencies (see section five).

Core units are allocated to 'bands' and the number of required *Core* units increases for each qualification level.

Band 1 *Core* units apply to qualification outcomes up to Certificate III (C10).

For qualification outcomes at Certificate IV (C7) and Diploma (C5), band 2 *Core* units apply as well as the band 1 *Core* units.

The groups of *Core* units are:

band 1 *Core* - C12 to C10 (*all* *Core* units for C12-C10 must be completed by C10)

band 2 *Core* - C9 to C5 (all *Core* units for C9-C5 must be completed by C5)

All band 1 *Core* units can be selected as *Specialisation* units in any classification/qualification level. Higher level *Core* units can be selected and included as *Specialisation* units below the level at which they are specified. Some band 2 *Core* units can be included in a Certificate III qualification and these are shown in the Training Package documents.

Core units have been included in the following areas:

- Mathematics/Computations
- Occupational Health and Safety
- Communication
- Work Organisation
- Quality Assurance
- Measurement
- Planning.

Specialisation units

These units describe the diverse range of competencies needed across the industry. The *Specialisation* units are also divided into four bands with some overlap between them.

The allocation of units to different *Specialisation* bands recognises the inherent differences in the level of difficulty of skills used in the industry, for example, band B skills are more difficult than band A skills. At the same time the large range of units in each band allows enterprises a wide choice.

The levels for *Specialisation* competency standards are as follows:

- band A - represents a range of competencies which may be used for career progression up to classification C8
- band B - represents a range of competencies which may be used for career progression between classifications C10 to C5, and must be used above C8.
- band E –is a limited range of competencies in the Boating Services field (50 series) which may only be used in Boating Services qualifications only, as indicated in the packaging rules for those qualification.

Some *Specialisation* units are regarded as both band A and band B units. Use of these dual band units is limited and this is also shown in the requirements for each Training Package qualification. These units are identified in the index to the competency standards as well as in the units themselves by way of a note.

Note: Some band A units can only be used in qualifications at Certificate III and above as shown in section four.

Availability of *Core* and *Specialisation* units for each qualification

Qualification title	Core units		Specialisation units		
	band 1	band 2	band A	band A/B	band B
Certificate I in Engineering	all	none	some	none	none
Certificate II in Engineering – Production	all	none	some	some	none
Certificate II in Engineering – Production Technology	all	one	some	some	none
Certificate III in Engineering – Production Systems	all	some	all	all	some
Certificate III in Engineering – Mechanical Trade	all	some	all	all	some
Certificate III in Engineering – Fabrication Trade	all	some	all	all	some
Certificate III in Engineering – Electrical/Electronic Trade	all	some	all	all	some
Certificate III in Engineering – Technician	all	all	all	all	all
Certificate III in Engineering – Jewellery	all	some	all	all	some
Certificate III in Marine Craft Construction	all	some	all	all	some
Certificate IV in Engineering	all	all	all	all	all
Diploma of Engineering	all	all	all	all	all

Note that band E units are not included in this table. These units only apply to Boating Services qualifications as shown in the packaging rules for those qualifications.

The Metal and Engineering Training Package documents and the Implementation Guide both provide additional information concerning the availability of competency units for use at particular levels.

The standards format

The unit code (numbering system) and title

The units in each field are identified by field and unit numbers as well as the national Training Package code identifier. The unit band is also included in the number. An example is on the following page:

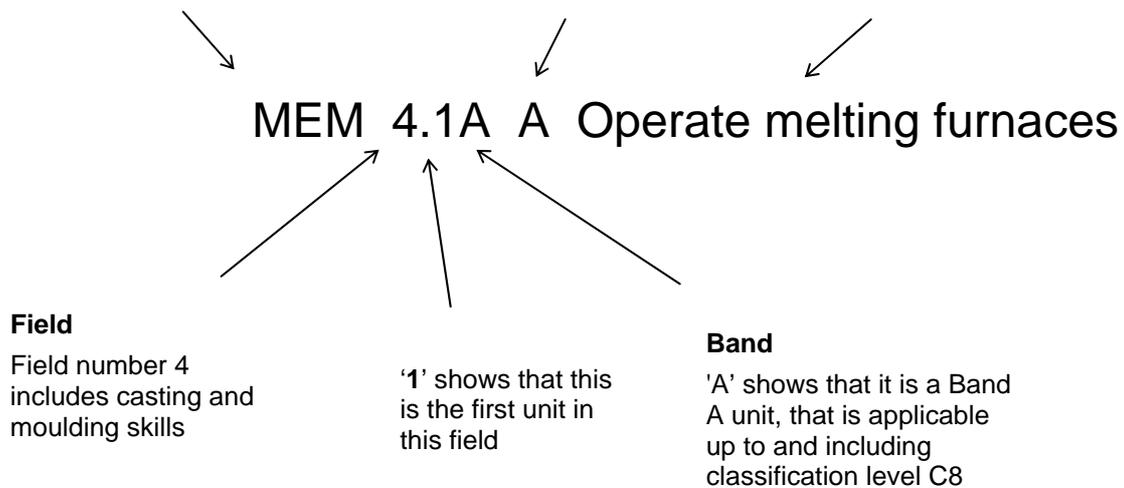
'MEM' shows that this unit is identified as part of the Metal and Engineering Training Package

Version identifier

'A' shows that this unit was endorsed in November 1998

Title

The unit title gives a direct statement of the activity covered by the unit



Notes

1. In this edition of the standards the letter 'C' refers to Core units. When further Specialisation units for Band C (C4 to C2) and Band D (C1) are developed the notation for Core units may be changed.
2. Further references to competency standards units in this introduction section will only include the number of the field, the unit number in the field and the band e.g 4.1A.

Pre-requisite units

The *pre-requisite* units indicate whether other specific competencies are required to support those included in that particular unit.

For example: A person must have the competencies included in the unit *MEM13.4AA Work safely with molten metals/glass* before they can acquire the competencies required by a number of other units in the Casting and Moulding field, such as *MEM4.1AA Operate melting furnaces*.

Where there are options within the pre-requisites then separate combinations or paths are shown. Where multiple paths (path 1, path 2 etc) are shown then the most appropriate path should be chosen.

Elements

The *elements* are statements identifying the components that go toward making up the unit of competence.

For example: '4.1A.1 Materials selected.'

Performance criteria

The *performance criteria* describe what has to be done to decide whether the requirements of the element are satisfied.

For example: '4.1A.1.2 Charge analysis is undertaken in accordance with standard operating procedures.'

Assessor guide

An *assessor guide* is provided for each criterion. It provides additional information and guidance for assessors to help them prepare appropriate assessment strategies and tools. It includes guidance on observation evidence to be gathered by an assessor as well as areas to confirm or clarify that the candidate has the required level of underpinning knowledge. Observation evidence may be gathered on a number of occasions when the candidate is undertaking the particular task. Confirming and clarifying underpinning skills and knowledge should be done in ways that are efficient and effective, such as oral questioning. Further details about assessment for each unit are included in the *evidence guide*.

Note: Competency must be demonstrated in all elements of a competency standards unit as well as any pre-requisite requirements before 'competency' can be granted.

Range statement

The *range statement* defines the context of the unit, gives further information about the level of autonomy, the equipment and materials that may be used and refers to legislative requirements or standards. Some range statements also provide 'signposts' to other competency units that may be more appropriate in some circumstances or should also be considered for particular applications of skill. Where lists of equipment, machinery, materials etc. are shown in the *range statement* then these are provided for illustrative purposes.

For example: 'This unit covers the use of singular or multi, coke, oil, gas fired or electric furnaces and a range of metals. All work is carried out to predetermined specifications and standards of quality, and so on.'

Evidence guide

The *evidence guide* includes information about recommended assessment context, critical aspects, conditions and special notes.

Unit weight

The *unit weight* assigns a value (standards points) to the unit. Other than the *Foundation* units, each unit of competency has been assigned a points value or 'weight'. When competency units are grouped to form a particular qualification or to describe a particular skills profile for a job or jobs within the enterprise, the unit weight points are totalled to show how that skills profile relates to an appropriate qualification in the Metal and Engineering Training Package or industrial classification structure. The weighting allocated to individual units acknowledges the fact that not all skills are equally complex and that it is unrealistic to develop standards in which each unit represents an equal 'amount' of competence.

The points allocated to individual units have been determined by consideration of a number of factors including the amount of formal and on the job training needed to gain that skill, the amount of underpinning knowledge and experience needed and the complexity of the skill.

For example: In the unit *Operate melting furnaces*: 'Unit weight 4'.

3. Foundation and Core competencies

Foundation competency units

Unit code	Unit title	Points
MEM1.1FA	Undertake interactive workplace communication	0
MEM1.2FA	Apply principles of occupational health and safety in a work environment	0
MEM1.3FA	Apply quality procedures	0
MEM1.4FA	Plan to undertake a routine task	0

Core competency units - band 1

At Certificate II in Engineering – Production (C12), the Foundation units and the C12 Core unit is needed.

Unit code	Unit title	Points
MEM2.1C12A	Apply quality systems	2
Total Core points at C12		2

At Certificate II in Engineering – Production Technology (C11), the Foundation units, C12 Core unit and C11 Core units are required.

Unit code	Unit title	Points
MEM2.2C11A	Organise and analyse information	2
MEM2.3C11B	Operate in a work based team environment	2
MEM2.4C11A	Assist in the provision of on the job training	2
MEM2.5C11A	Measure with graduated devices	2
Add C12 Core points		<u>2</u>
Total Core points at C11		10

At Certificate III in Engineering – Trade/Production (C10) the Foundation units, C12 Core unit, C11 Core units and C10 Core units are required.

Unit code	Unit title	Points
MEM2.6C10A	Plan a complete activity	4
MEM2.7C10A	Perform computations – basic	2
MEM2.8C10A	Perform computations	2
MEM2.9C10A	Perform computer operations	2
Add C12 and C11 Core points		<u>10</u>
Total Core points at C10		20

Core competency units - band 2

Total of 16 points to be gained by C5 (see notes attached to qualifications above 96 points)

Unit code	Unit title	Points
MEM2.10C5A	Write reports	2
MEM2.11C5A	Research and prepare presentations and reports	2
MEM2.13C5A	Perform mathematical computations	4
MEM2.14C5A	Use graphical techniques and perform simple statistical computations	2
MEM2.15C5A	Operate in an autonomous team environment	2
MEM2.16C5A	Interpret quality specifications and manuals	4
Total Core points in band 2		16

(Note that C12, C11, C10 and C5 refer to industrial award classifications.)

4. Competency standards at Certificate III and above

These units can only be used in qualifications at Certificate III and above – that is, they can be accessed at C11 classifications for progression to C10 and above

MEM2.10C5A	Write reports
MEM2.11C5A	Research and prepare presentations and reports
MEM2.13C5A	Perform mathematical computations
MEM2.14C5A	Use graphical techniques and perform simple statistical computations
MEM2.15C5A	Operate in an autonomous team environment (SEE NOTE BELOW)
MEM4.10AA	Develop and manufacture wood patterns
MEM4.11AA	Produce polymer patterns
MEM4.12AA	Assemble plated patterns
MEM4.13AA	Develop and manufacture polystyrene patterns
MEM4.14AA	Develop and manufacture production patterns
MEM4.15AA	Develop and manufacture vacuum forming moulds and associated equipment
MEM4.16AB	Develop and manufacture precision models
MEM4.17AA	Develop and manufacture gear, conveyor screws and propeller patterns
MEM5.16AB	Perform advanced welding using manual metal arc welding process
MEM5.18AB	Perform advanced welding using gas metal arc welding process
MEM5.20AB	Perform advanced welding using gas tungsten arc welding process
MEM5.22AB	Perform advanced welding using oxy acetylene welding process
MEM5.36AB	Repair/replace/modify fabrications
MEM5.38AA	Advanced geometric development – Cylindrical/Rectangular
MEM5.39AA	Advanced geometric development – Conical
MEM5.40AA	Advanced geometric development – Transitions
MEM7.2AA	Perform precision shaping/planing/slotting operations
MEM7.9AA	Perform precision jig boring operations
MEM7.10AA	Perform tool and cutter grinding operations
MEM7.11AA	Complex milling operations
MEM7.12AA	Complex grinding operations
MEM7.21AA	Perform complex lathe operations
MEM7.23BB	Program and set up CNC manufacturing cell
MEM10.3AA	Install and test electrical wiring and circuits (up to 1000vAC/1500vDC)
MEM10.4AA	Enter and change programmable controller operational parameters
MEM10.6AA	Install machine/plant
MEM12.3AA	Precision mechanical measurement
MEM12.4AA	Precision electrical/electronic measurement
MEM12.6AA	Mark off/out (general engineering)
MEM12.7AB	Mark off/out structural fabrications and shapes
MEM14.1BA	Schedule material deliveries
MEM14.3BA	Undertake basic production scheduling
MEM16.1BA	Give formal presentations and take part in meetings
MEM18.6AA	Dismantle/repair/replace/assemble and fit engineering components
MEM18.45AA	Fault find/repair electrical equipment/components which use up to 240v single phase supply
MEM18.46AA	Fault find/repair electrical equipment/components which use up to 1000vAC/1500vDC
MEM18.48AA	Fault find and repair/rectify basic electrical circuits
MEM18.62AA	Install, maintain and calibrate instrument sensors, transmitters & final control elements

Note:– *MEM2.15C5A Operate in an autonomous team environment* may be included in a Certificate II in Engineering – Production Technology or higher qualification, that is, accessed at C11 for progression to C10 and above.

5. Key Competencies

Recognition of competency in a Key Competency does not imply competency in any respective Metal and Engineering competency standards unit as shown on this map.

Competency Standards		Key Competencies																				
		Collecting, analysing and organising information			Communicating ideas and information			Planning and organising activities			Working with others and in teams			Using mathematical ideas and techniques			Solving problems			Using Technology		
		1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3			
Foundation units																						
MEM1.1FA	Undertake Interactive workplace communication	■			■						■											
MEM1.2FA	Apply principles of OH & S in work environment	■			■			■												■		
MEM1.3FA	Apply quality procedures	■						■														
MEM1.4FA	Plan to undertake a routine task	■						■								■						
Band 1 Core units																						
MEM2.1C12A	Apply quality systems	■			■						■											
MEM 2.2C11A	Organise and analyse information	■			■															■		
MEM 2.3C11B	Operate in work based team environment	■			■			■			■											
MEM 2.4C11A	Assist in the provision of on-the-job training	■				■					■						■					
MEM 2.5C11A	Measure with graduated devices							■						■						■		
MEM 2.6C10A	Plan a complete activity	■			■			■								■						
MEM 2.7C10A	Perform computations - basic													■								
MEM 2.8C10A	Perform computations	■												■						■		
MEM 2.9C10A	Perform computer operations	■												■							■	

6. Index of competency standards

Index of competency units

This issue is dated May 2003. The 'change information' highlights the most recent endorsed changes.

V = Version (A,B,C etc.)

P = Points (unit weighting)

* = Units marked with * have dual status and are to be regarded as both Specialisation band A units and Specialisation band B units for progression to C5 (AQF level V)

** = Units marked with ** have dual status and are to be regarded as both Specialisation band A units and Specialisation band B units for progression to C7 (AQF level IV)

Unit code	V	Unit title	Change information	P
1. Foundation units				
MEM1.1F	A	Undertake interactive workplace communication	no change	0
MEM1.2F	A	Apply principles of Occupational Health and Safety in work environment	<i>minor title change</i>	0
MEM1.3F	A	Apply quality procedures	no change	0
MEM1.4F	A	Plan to undertake a routine task	no change	0
2. Core units				
MEM2.1C12	A	Apply quality systems	no change	2
MEM2.2C11	A	Organise and analyse information	no change	2
MEM2.3C11	B	Operate in a work based team environment	no change	2
MEM2.4C11	A	Assist in the provision of on the job training	no change	2
MEM2.5C11	A	Measure with graduated devices	no change	2
MEM2.6C10	A	Plan a complete activity	no change	4
MEM2.7C10	A	Perform computations – basic	<i>minor title change</i>	2
MEM2.8C10	A	Perform computations	no change	2
MEM2.9C10	A	Perform computer operations	no change	2
MEM2.10C5	A	Write reports	no change	2
MEM2.11C5	A	Research and prepare presentations and reports	no change	2
MEM2.13C5	A	Perform mathematical computations	no change	4
MEM2.14C5	A	Use graphical techniques and perform simple statistical computations	no change	2
MEM2.15C5	A	Operate in an autonomous team environment	no change	2
MEM2.16C5	A	Interpret quality specifications and manuals	no change	4
3. Assembly				
MEM3.1A	A	Manual production assembly	no change	4
MEM3.2A	A	Precision assembly	no change	4

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Unit code	V	Unit title	Change information	P
MEM3.3A	A	Sheet and plate assembly	no change	4
MEM3.4A	A	Electronic/electrical assembly (production)	no change	8
MEM3.5A	A	Rework and repair (electrical/electronic production)	no change	8
MEM3.6A	A	Setting assembly stations	no change	2
MEM3.7A	A	Setting multistage continuous process lines	no change	6
4. Casting and moulding				
MEM4.1A	A	Operate melting furnaces	no change	4
MEM4.2A	A	Gravity die casting	no change	2
MEM4.3A	A	Operate pressure die casting machine	no change	4
MEM4.4A	A	Prepare and mix sand for metal moulding	no change	4
MEM4.5A	A	Produce moulds and cores by hand (jobbing)	no change	16
MEM4.6A	A	Operate sand moulding and core making machines	no change	8
MEM4.7A	A	Pour molten metal	no change	4
MEM4.8A	A	Fettle and trim metal castings/forgings	no change	4
MEM4.9A	B	Inspect/test castings/forgings	pre-requisite correction	6
MEM4.10A	A	Develop and manufacture wood patterns	no change	20
MEM4.11A	A	Produce polymer patterns	no change	8
MEM4.12A	A	Assemble plated patterns	no change	8
MEM4.13A	A	Develop and manufacture polystyrene patterns	no change	2
MEM4.14A	A	Develop and manufacture production patterns	no change	8
MEM4.15A	A	Develop and manufacture vacuum forming moulds and associated equipment	no change	6
MEM4.16A	B	Develop and manufacture precision models	pre-requisite correction	6
MEM4.17A	A	Develop and manufacture gear, conveyor screw and propeller patterns	no change	4
MEM4.18A	A	General woodworking machine operations	no change	4
MEM4.19A	A	Refractory installation and repair	no change	4
5. Fabrication				
MEM5.1A	A	Manual soldering/desoldering – electrical/electronic components	no change	4
MEM5.2A	A	High reliability soldering and desoldering	no change	4
MEM5.3A	A	Soft soldering (basic)	no change	2
MEM5.4A	B	Perform routine oxy acetylene welding	no change	2
MEM5.5A	A	Carry out mechanical cutting	no change	2
MEM5.6A	A	Perform brazing and/or silver soldering	no change	2
MEM5.7A	B	Manual heating and thermal cutting	no change	2
MEM5.8A	B	Advanced manual thermal cutting, gouging and shaping	no change	2
MEM5.9A	B	Automated thermal cutting	no change	2

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Unit code	V	Unit title	Change information	P
MEM5.10A	A	Undertake fabrication, forming, bending and shaping	no change	8
MEM5.11A	B	Assemble fabricated components	no change	8
MEM5.12A	B	Perform routine manual metal arc welding	no change	2
MEM5.13A	B	Perform manual production welding	no change	2
MEM5.14A	B	Monitor quality of production welding/fabrications	no change	2
MEM5.15A	B	Weld using manual metal arc welding process	no change	4
MEM5.16A	B	Perform advanced welding using manual metal arc welding process	no change	4
MEM5.17A	B	Weld using gas metal arc welding process	no change	4
MEM5.18A	B	Perform advanced welding use gas metal arc welding process	no change	4
MEM5.19A	B	Weld using gas tungsten arc welding process	no change	4
MEM5.20A	B	Perform advanced welding using gas tungsten arc welding process	no change	4
MEM5.22A	B	Perform advanced welding using oxy acetylene welding process	no change	6
MEM5.23A	B	Weld using submerged arc welding process	no change	4
MEM5.24B	A	Perform welding supervision	no change	12
MEM5.25B	B	Perform welding/fabrication inspection	no change	12
MEM5.26A	A	Apply welding principles	no change	4
MEM5.36A	B	Repair/replace/modify fabrications	no change	4
MEM5.37A	A	Geometric development	no change	6
MEM5.38A	A	Advanced geometric development – Cylindrical/Rectangular	minor title change	2
MEM5.39A	A	Advanced geometric development – Conical	minor title change	2
MEM5.40A	A	Advanced geometric development – Transitions	minor title change	4
MEM5.41A	A	Weld using powder flame spraying	no change	4
MEM5.42A	A	Perform welds to code standards using flux core arc welding process	no change	6
MEM5.43A	A	Perform welds to code standards using gas metal arc welding process	no change	6
MEM5.44A	A	Perform welds to code standards using gas tungsten arc welding process	no change	6
MEM5.45A	A	Perform pipe welds to code standards using manual metal arc welding process	no change	6
MEM5.46A	A	Perform welds to code standards using manual metal arc welding process	no change	6
MEM5.47A	A	Weld using flux core arc welding process	no change	4
MEM5.48A	A	Perform advanced welding using flux core arc welding process	no change	4
MEM5.49A	B	Perform routine gas tungsten arc welding	elements, assessor guide	2

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Unit code	V	Unit title	Change information	P
MEM5.50A	A	Perform routine gas metal arc welding	no change	2
6. Forging				
MEM6.1A	A	Hand forging	no change	4
MEM6.2A	A	Hammer forging	no change	4
MEM6.3A	B	Carry out heat treatment	no change	6
MEM6.4A	A	Select heat treatment processes and test finished product	no change	6
MEM6.5A	A	Drop and upset forging	no change	4
MEM6.6A	B	Spring repair	pre-requisite correction	4
MEM6.7A	A	Perform basic incidental heat/ quenching, tempering and annealing	no change	2
7. Machine and process operations				
MEM7.1A	A	Operational maintenance of machines/equipment	no change	2
MEM7.2A	A	Perform precision shaping/planing/slotting operations	no change	4
MEM7.3A	A	Setting machines (routine)	no change	4
MEM7.4A	A	Setting machines (complex)	no change	8
MEM7.5A	A	Perform general machining	no change	8
MEM7.6A	A	Perform lathe operations	no change	4
MEM7.7A	A	Perform milling operations	no change	4
MEM7.8A	B	Perform grinding operations	no change	4
MEM7.9A	A	Perform precision jig boring operations	no change	4
MEM7.10A	A	Perform tool and cutter grinding operations	no change	4
MEM7.11A	A	Complex milling operations	no change	4
MEM7.12A	A	Complex grinding operations	no change	4
MEM7.13A	A	Perform machining operations using horizontal and/or vertical boring machine	no change	4
MEM7.14A	A	Perform electro-discharge machining operations	no change	4
MEM7.15A	A	Set NC/CNC machines/process (basic)	minor title correction	2
MEM7.16A	B	**Set and edit NC/CNC machine/process	path 4 deleted	4
MEM7.18A	B	**Basic NC/CNC programming	path 4 deleted	4
MEM7.19A	B	**Program NC/CNC machining centre	path 4 deleted	2
MEM7.20A	B	**Program multiple spindle and/or multiple axis NC/CNC machining centre	path 4 deleted	2
MEM7.21A	A	Perform complex lathe operations	no change	4
MEM7.22A	B	**Advanced programming of CNC wire cut machines	path 4 deleted	2
MEM7.23B	B	Program and set up CNC manufacturing cell	path 4 deleted	6
MEM7.24A	A	Operate and monitor machine/process	no change	4
MEM7.25A	A	Advanced machine/process operation	no change	6
MEM7.26A	A	Advanced plastic processing	no change	6

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Unit code	V	Unit title	Change information	P
MEM7.27A	A	Advanced press operations	no change	6
MEM7.28A	A	Operate NC/CNC machine/process (basic)	no change	2
MEM7.29A	A	Perform routine sharpening/maintenance of production tools and cutters	no change	4
MEM7.30A	B	Perform metal spinning lathe operations (basic)	<i>pre-requisite removed</i>	6
MEM7.31A	B	Perform metal spinning lathe operations (complex)	<i>pre-requisite removed</i>	4
MEM7.32A	A	Use workshop machines for basic operations	no change	2
MEM7.33A	A	Operate and monitor basic boiler	no change	6
8. Surface Finishing				
MEM8.1A	A	Wire, jig and barrel load/unload work	no change	4
MEM8.2A	B	Pre-treat work for subsequent surface coating	<i>range statement</i>	4
MEM8.3A	B	Finish work using acidic/alkaline electroplating solutions	<i>all components of unit, points</i>	6
MEM8.4A	A	Finish work using wet, dry and vapour deposition methods	no change	4
MEM8.5A	A	Prepare and produce specialised coatings electrolytically	<i>title correction</i>	4
MEM8.6A	A	Produce clear and/or coloured and/or sealed anodised films on aluminium	no change	2
MEM8.7A	A	Control surface finish production and finished product quality	no change	4
MEM8.8A	A	Operate and control surface finishing waste treatment process	no change	3
MEM8.9A	B	Maintain basic solutions	<i>title, element, range statement</i>	2
MEM8.10A	A	Manually finish/polish materials	no change	6
MEM8.11A	A	Undertake surface preparation using solvents and/or mechanical means	no change	2
MEM8.12A	A	Prepare surfaces by abrasive blasting (basic)	no change	4
MEM8.13A	A	Prepare surfaces by abrasive blasting (advanced)	no change	4
MEM8.14A	A	Apply protective coatings (basic)	no change	4
MEM8.15A	A	Apply protective coatings (advanced)	no change	4
MEM8.16A	A	Control blast coating by-products, materials and emissions	no change	1
MEM8.18A	A	Electroplate engineering coatings	<i>new unit</i>	6
MEM8.19A	A	Electroplate protective finishes	<i>new unit</i>	6
MEM8.20A	A	Electroplate decorative finishes	<i>new unit</i>	6
9 Drawing, drafting and design				
MEM9.1A	A	Draw and interpret sketch	no change	2
MEM9.2A	A	Interpret technical drawing	no change	4
MEM9.3A	A	Prepare basic engineering drawing	no change	8

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Unit code	V	Unit title	Change information	P
MEM9.4B	A	Electrical/electronic detail drafting	no change	8
MEM9.5A	A	Basic engineering detail drafting	no change	8
MEM9.6B	A	Advanced engineering detail drafting	no change	4
MEM9.7B	A	Advanced mechanical detail drafting	no change	4
MEM9.8B	A	Advanced structural detail drafting	no change	4
MEM9.9B	B	Create 2D drawings using computer aided design system	no change	8
MEM9.10B	B	Create 3D models using computer aided design system	no change	4
MEM9.11A	A	Apply basic engineering design concepts	no change	6
MEM9.21A	A	Interpret and produce curved 3-dimensional shapes	new unit	4
10. Installation and commissioning				
MEM10.1A	B	Erect structures	no change	4
MEM10.2A	A	Terminate and connect electrical wiring	no change	3
MEM10.3A	A	Install and test electrical wiring and circuits (up to 1000vAC/1500vDC)	minor title change	8
MEM10.4A	A	Enter and change programmable controller operational parameters	no change	2
MEM10.5A	A	Commission programmable controller programs	no change	4
MEM10.6A	A	Install machine/plant	no change	4
MEM10.7B	B	Modification of control systems	pre-requisites and pathways corrected	6
MEM10.8B	A	Undertake commissioning procedures for plant and/or equipment	no change	4
MEM10.9A	A	Install refrigeration and air conditioning plant and equipment	no change	4
MEM10.10A	A	Install pipework and pipework assemblies	no change	4
MEM10.11A	A	Terminate and connect specialist cables	no change	2
MEM10.13A	A	Assemble and install equipment and accessories/ancillaries	new unit	2
11. Materials handling				
MEM11.1A	B	Erect/dismantle scaffolding and equipment	no change	4
MEM11.2A	B	Erect/dismantle complex scaffolding and equipment	no change	4
MEM11.3A	A	Coordinate erection/dismantling of complex scaffolding/equipment	no change	4
MEM11.4A	A	Undertake dogging/crane chasing	no change	4
MEM11.5A	A	Pick and process order	no change	4
MEM11.6A	A	Production packaging	no change	2
MEM11.7A	A	Administer inventory procedures	no change	4
MEM11.8A	A	Package materials (stores and warehouse)	no change	2
MEM11.9A	A	Handle/move bulk fluids/gases	no change	4
MEM11.10A	A	Operate mobile load shifting equipment	no change	4
MEM11.11A	A	Manual handling	no change	2

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Unit code	V	Unit title	Change information	P
MEM11.12A	A	Purchase materials	no change	6
MEM11.13A	A	Undertake warehouse receipt process	no change	4
MEM11.14A	A	Undertake warehouse despatch process	minor title change	4
MEM11.15A	A	Manage warehouse inventory system	no change	6
MEM11.16A	A	Order materials	no change	2
MEM11.17A	A	Organise and lead stocktakes	no change	4
MEM11.18A	A	Organise and maintain warehouse stock receipt and/or despatch system	no change	6
MEM11.19A	A	Undertake tool store procedures	no change	4
MEM11.20A	A	Perform advanced warehouse computer operations	no change	4
MEM11.21A	A	Advanced operation of load shifting equipment	no change	2
MEM11.22A	A	Operate fixed/movable load shifting equipment	no change	4
12. Measurement				
MEM12.1A	A	Use comparison and basic measuring devices	no change	2
MEM12.2A	A	Electrical/electronic measurement	no change	2
MEM12.3A	A	**Precision mechanical measurement	no change	2
MEM12.4A	A	**Precision electrical/electronic measurement	no change	4
MEM12.5B	A	Calibrating measuring equipment	no change	6
MEM12.6A	A	Mark off/out (general engineering)	no change	4
MEM12.7A	B	Mark off/out structural fabrications and shapes	element, range statement	4
MEM12.19A	A	Measure components using coordinate measuring machine	no change	4
MEM12.20A	A	Set and operate coordinate measuring machine	no change	2
MEM12.21A	A	Program coordinate measuring machine	no change	4
MEM12.22A	A	Program coordinate measuring machine (advanced)	no change	2
13. Occupational Health and Safety				
MEM13.1A	A	Perform emergency first aid	no change	1
MEM13.2A	A	Undertake Occupational Health & Safety activities in the workplace	minor title change	3
MEM13.3A	A	Work safely with industrial chemicals and materials	no change	2
MEM13.4A	A	Work safely with molten metals/glass	no change	2
MEM13.5B	A	Manage Occupational Health & Safety for a workplace or section of a workplace	minor title change	12
MEM13.6A	A	Monitor Occupational Health & Safety factors for an enterprise or section of an enterprise	minor title change	4
MEM13.7A	A	Maintain water cooling towers and treatment systems	no change	2

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Unit code	V	Unit title	Change information	P
MEM13.13A	A	Work safely with ionizing radiation	no change	4
14. Planning				
MEM14.1B	A	Schedule material deliveries	no change	8
MEM14.2B	A	Basic process planning	no change	8
MEM14.3B	A	Undertake basic production scheduling	no change	8
15. Quality				
MEM15.1A	A	Perform basic statistical quality control	no change	2
MEM15.3A	A	Use improvement processes in team activities	no change	4
MEM15.4A	A	Perform inspection (basic)	no change	2
MEM15.5A	A	Perform inspection (advanced)	no change	4
MEM15.7B	A	Conduct product and/or process capability studies	no change	6
MEM15.8B	A	Perform advanced statistical quality control	no change	2
MEM15.10B	A	Perform laboratory procedures	no change	8
MEM15.11B	A	Exercise external quality assurance	no change	6
MEM15.12B	A	Maintain/supervise application of quality procedures	no change	4
MEM15.15A	A	*Examine trading practices	no change	5
MEM15.16A	A	*Inspect pre-packed articles	no change	8
MEM15.17B	A	Use and maintain reference standards	no change	3
MEM15.18B	A	Investigate consumer complaints	no change	6
MEM15.19B	A	Conduct a field inspection	no change	12
MEM15.20B	B	Perform verification/certification or in-service inspection	<i>pre-requisite corrected</i>	12
MEM15.21B	B	Conduct audits of servicing licensees and public weighbridge licensees	<i>pre-requisite corrected</i>	4
MEM15.22A	A	*Verify reference standards	no change	8
16. Communication				
MEM16.1B	A	Give formal presentations and take part in meetings	no change	2
MEM16.2A	B	Participate in formal interviews and negotiations	no change	4
MEM16.3B	A	Advanced customer service	no change	2
MEM16.4A	A	Perform internal/external customer service	no change	2
17. Training				
MEM17.1A	A	*Assist in development and deliver training in the workplace	no change	2
MEM17.2A	A	*Conduct workplace assessment	no change	2
18. Maintenance and diagnostics				
MEM18.1A	B	Use hand tools	no change	2
MEM18.2A	A	Use power tools/hand held operations	no change	2
MEM18.3A	B	Use tools for precision work	no change	4

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Unit code	V	Unit title	Change information	P
MEM18.4A	A	Maintain and overhaul mechanical equipment	no change	4
MEM18.5A	A	Bearings – fault diagnosis installation and removal	no change	4
MEM18.6A	A	Dismantle/repair/replace/assemble and fit engineering components	no change	6
MEM18.7A	A	Maintain and repair mechanical drives and mechanical transmission assemblies	no change	4
MEM18.8A	A	Balance equipment	no change	2
MEM18.9A	A	Levelling and alignment of machines and engineering components	no change	4
MEM18.10A	B	*Equipment condition monitoring and recording	pre-requisites removed	4
MEM18.11A	B	**Shut down and isolate machines/equipment	no change	2
MEM18.12A	A	Mechanical seals – installation and removal	no change	2
MEM18.13A	A	Gland packing	no change	2
MEM18.14A	A	Tool, gauge and die manufacture	no change	8
MEM18.15A	A	Tool and die maintenance	no change	4
MEM 18.16B	A	Analyse plant and equipment condition monitoring results	no change	4
MEM18.17B	B	Modify mechanical system and equipment	minor title change, pre-requisite removed	8
MEM18.18A	B	Maintain pneumatic system components	no change	4
MEM18.19A	A	*Maintain and repair pneumatic systems	no change	4
MEM18.20A	B	Maintain hydraulic system components	no change	4
MEM18.21A	A	*Maintain and repair hydraulic systems	no change	4
MEM18.22A	A	*Maintain/repair/replace fluid power controls	no change	8
MEM18.23B	A	Modify fluid power system operation	no change	8
MEM18.24A	A	Maintain and repair engine cooling systems	no change	2
MEM18.25A	A	Service combustion engines	no change	2
MEM18.26A	B	Test compression ignition fuel systems	no change	4
MEM18.27A	B	Overhaul engine fuel system components	no change	8
MEM18.28A	B	Maintain and repair engine lubrication systems	no change	2
MEM18.29A	A	Tune diesel engine	no change	4
MEM18.30A	A	Diagnose and repair low voltage electrical systems	no change	8
MEM18.31A	A	Diagnose and repair low voltage starting systems	no change	2
MEM18.32A	A	Maintain and repair induction/exhaust systems	no change	4
MEM18.33A	A	Perform engine bottom-end overhaul	no change	4
MEM18.34A	A	Perform engine top-end overhaul	no change	8
MEM18.35A	A	Diagnose and repair braking systems	no change	6
MEM18.36B	A	Maintain and repair scientific analysis	no change	10

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Unit code	V	Unit title	Change information	P
		equipment		
MEM18.37A	A	Diagnose and repair low voltage charging systems	no change	2
MEM18.38A	A	Maintain and repair wheels and tyres	no change	2
MEM18.39A	A	Diagnose and repair track type undercarriage	no change	4
MEM18.40A	A	Maintain and repair suspension systems	no change	4
MEM18.41A	A	Maintain and repair steering systems	no change	4
MEM18.42A	B	Diagnose and repair manual transmissions	no change	4
MEM18.43A	B	Diagnose and repair automatic transmissions	no change	8
MEM18.44A	B	Diagnose and repair drive line and final drives	no change	4
MEM18.45A	A	Fault find/repair electrical equipment/components which use up to 240v single phase supply	minor title change	4
MEM18.46A	A	Fault find/repair electrical equipment/components which use up to 1000vAC/1500vDC	minor title change	6
MEM18.47A	A	Diagnose and maintain electronic controlling systems on mobile plant	no change	4
MEM18.48A	A	Fault find and repair/rectify basic electrical circuits	no change	10
MEM18.49A	A	**Disconnect/reconnect fixed wired equipment which use up to 1000vAC/1500vDC	minor title change	3
MEM18.50A	A	**Disconnect/reconnect fixed wired equipment over 1000vAC/1500vDC	no change	3
MEM18.51A	A	*Fault find and repair/rectify complex electrical circuits	no change	6
MEM18.52A	A	Maintain and repair fluid power systems for mobile plant	no change	4
MEM18.53B	A	Modify fluid power control systems	no change	6
MEM18.54A	A	**Fault find, test, calibrate instrumentation systems, equipment	no change	8
MEM18.55A	A	Dismantle, replace and assemble engineering components	no change	3
MEM18.56A	A	**Diagnose and repair analog equipment and components	no change	10
MEM18.57A	A	Maintain/service analog/digital electronic equipment	no change	6
MEM18.58A	B	*Modify electronic equipment	range statement	4
MEM18.59B	A	Modify electronic systems	no change	4
MEM18.60A	A	*Maintain, repair control instrumentation - single and multiple loop control systems	minor title change	8
MEM18.61B	A	Maintain/calibrate complex control systems	no change	8
MEM18.62A	A	**Install, maintain and calibrate instrumentation sensors, transmitters and final control elements	no change	8
MEM18.63A	A	Terminate signal and data cables	no change	4

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Unit code	V	Unit title	Change information	P
MEM18.64A	A	Maintain instrumentation system components	no change	6
MEM18.65A	A	**Diagnose and repair digital equipment and components	no change	10
MEM18.66A	A	*Diagnose and repair microprocessor based equipment	no change	6
MEM18.67A	A	*Tune control loops - multi controller or multi element systems	no change	6
MEM18.69B	A	Maintain, repair instrumentation process control analysers	no change	6
MEM18.70B	B	Modify complex electrical circuits and systems	pre-requisite correction	6
MEM18.71A	A	Connect/disconnect fluid conveying system components	no change	2
MEM18.72A	A	Manufacture fluid conveying conductor assemblies	no change	4
MEM18.86A	A	Test, evacuate and charge refrigeration systems	no change	4
MEM18.87A	A	Service and repair domestic and light commercial refrigeration and air conditioning equipment	no change	6
MEM18.88A	A	Maintain and repair commercial air conditioning systems and components	no change	4
MEM18.89A	A	Maintain and repair large central air handling systems	no change	6
MEM18.90A	A	Maintain and repair industrial refrigeration systems and components	no change	6
MEM18.91A	A	*Maintain and repair multi stage, cascade, and/or ultra-cold industrial refrigeration systems	no change	4
MEM18.92A	A	**Maintain and repair commercial and/or industrial refrigeration and/or air conditioning controls	no change	6
MEM18.93B	A	Maintain and repair integrated industrial refrigeration and/or large air handling system controls	no change	8
MEM18.94A	A	Service and repair of commercial refrigeration	no change	6
19. Jewellery and horological				
MEM19.1A	A	Jewellery metal casting	no change	6
MEM19.2A	A	Prepare jewellery illustrations	no change	4
MEM19.3A	A	Handle gem materials (basic)	no change	2
MEM19.4A	A	Handle and examine gemstone materials	no change	6
MEM19.5A	A	Produce three-dimensional precision items	no change	8
MEM19.6A	A	Watch battery replacement	no change	1
MEM19.7A	A	Perform gemstone setting	no change	6
MEM19.8A	A	*Prepare jewellery designs	no change	6
MEM19.9A	A	Perform investment procedures for "lost wax" casting process	minor title change	1

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Unit code	V	Unit title	Change information	P
MEM19.10A	A	Produce rubber moulds for "lost wax" casting process	<i>minor title change</i>	2
MEM19.11A	A	Perform wax injection of moulds for "lost wax" casting process	<i>minor title change</i>	2
MEM19.12A	A	Produce jewellery wax model	no change	4
MEM19.13A	A	*Produce jewellery metal masters	no change	4
MEM19.14A	A	Perform hand engraving	no change	4
MEM19.15A	A	Perform jewellery enamelling	no change	4
MEM19.16A	A	Construct jewellery components	<i>new unit</i>	4
MEM19.17A	A	Fabricate jewellery items	<i>new unit</i>	6
MEM19.18A	A	*Repair jewellery items	<i>new unit</i>	6
MEM19.20A	A	Fault-find and maintain micro-mechanisms	<i>new unit</i>	4
MEM19.21A	A	Diagnose and service micro-mechanisms	<i>new unit</i>	6
MEM19.22A	A	*Perform precision micro-mechanism diagnosis and servicing	<i>new unit</i>	6
24. Non-destructive testing				
MEM24.1A	A	Perform basic penetrant testing	no change	2
MEM24.2A	A	*Perform penetrant testing	no change	4
MEM24.3A	A	Perform basic magnetic particle testing	no change	2
MEM24.4A	A	*Perform magnetic particle testing	no change	4
MEM24.5A	A	Perform basic eddy current testing	no change	2
MEM24.6A	A	*Perform eddy current testing	no change	6
MEM24.7A	A	Perform ultrasonic thickness testing	no change	2
MEM24.8A	A	*Perform ultrasonic testing	no change	6
MEM24.9A	A	Perform basic radiographic testing	no change	2
MEM24.10A	A	*Perform radiographic testing	no change	6
MEM24.11B	A	Establish non-destructive tests	no change	12
MEM24.12A	A	*Apply metallurgy principles	no change	4
25. Marine craft construction				
MEM25.1A	A	Apply fibre-reinforced materials	<i>new unit</i>	2
MEM25.2A	A	Form and integrate fibre-reinforced structures	<i>new unit</i>	4
MEM25.3A	A	Set up marine vessel structures	<i>new unit</i>	4
MEM25.4A	A	Fair and shape surfaces	<i>new unit</i>	2
MEM25.5A	A	Construct and assemble marine vessel timber components	<i>new unit</i>	8
MEM25.6A	A	Undertake marine sheathing operations	<i>new unit</i>	2
MEM25.7A	A	Maintain marine vessel surfaces	<i>new unit</i>	4
MEM25.8A	A	Repair marine vessel surfaces and structures	<i>new unit</i>	4
MEM25.9A	A	Form timber shapes using hot processes	<i>new unit</i>	2
MEM25.10A	A	Perform fitout procedures	<i>new unit</i>	4
MEM25.11A	A	Install marine systems	<i>new unit</i>	8
MEM25.12A	A	Install and test operations of marine	<i>new unit</i>	6

Unit code	V	Unit title	Change information	P
		auxiliary systems		
MEM25.13A	A	*Produce three dimensional plugs/moulds	<i>new unit</i>	12
MEM25.14A	A	Perform marine slipping operations	<i>new unit</i>	2
50. Boating services				
MEM50.1E	A	Classify recreational boating technologies and features	<i>new unit</i>	n/a
MEM50.2A	A	Work safely on marine craft	<i>new unit</i>	1
MEM50.3A	A	Follow work procedures to maintain the marine environment	<i>new unit</i>	1
MEM50.4A	A	Maintain quality of environment by following marina codes	<i>new unit</i>	1
MEM50.5E	A	Refuel vessels	<i>new unit</i>	n/a
MEM50.6E	A	Check operational capability of marine craft	<i>new unit</i>	n/a
MEM50.7E	A	Check operational capability of sails and sail operating equipment	<i>new unit</i>	n/a
MEM50.8E	A	Carry out trip preparation and planning	<i>new unit</i>	n/a
MEM50.9A	A	Safely operate a mechanically powered recreational boat	<i>new unit</i>	2
MEM50.10E	A	Respond to boating emergencies and incidents	<i>new unit</i>	n/a

Unit MEM 1.1F A Undertake interactive workplace communication

Band – Foundation

Field – Foundation

Unit Weight 0

Element 1.1F.1 Communicate information about tasks, processes, events or skills

Criteria 1.1F.1.1

An appropriate choice of communication techniques, eg: telephone, face to face, written report, sketches etc. are used.

Assessor guide: observe that –

Appropriate communication techniques are chosen as required by: - the information to be conveyed - the receiver of the communication - the context in which the communication takes place.

Assessor guide: confirm that –

The person can explain: - the advantages and disadvantages of different ways of communicating - why a particular communication technique was chosen for a particular situation.

Criteria 1.1F.1.2

Multiple operations involving several topics/areas are communicated.

Assessor guide: observe that –

Communication covering a variety of topics and content areas takes place so that the information is clearly understood by the receiver(s) of the message.

Assessor guide: confirm that –

Criteria 1.1F.1.3

Listening is undertaken without continuous interruptions of the speaker.

Assessor guide: observe that –

The person follows good listening techniques and listens in a variety of situations without interrupting the speaker. Situations covered might be listening to instructions, technical information, briefings, descriptions of faults and problems, and others.

Assessor guide: confirm that –

The person is able to describe good listening techniques and explain the importance of not interrupting the speaker.

Criteria 1.1F.1.4

Questions are used to gain extra information.

Assessor guide: observe that –

Questions are asked to clarify the message. The questions state clearly what their purpose is and identify information required. If necessary, follow up questions are used to gain further information or clarify the replies.

Assessor guide: confirm that –

The person is able to give examples of a number of different types of questions appropriate in particular situations.

Criteria 1.1F.1.5

Correct sources of information are identified.

Assessor guide: observe that –

Information is gained from appropriate sources for the outcome required. Examples might be technical manuals, job cards, orders, production schedules, clients, technical experts, and others.

Assessor guide: confirm that –

The person is able to give examples of a range of sources of information and explain which would be used in particular situations and why.

Criteria 1.1F.1.6

Information is selected and sequenced appropriately.

Assessor guide: observe that –

The information is selected to meet the purpose for which it is required in terms of level of detail, credibility accuracy and so on. Information gained is logically organised so that it can be used to fulfil the purpose for which it was required.

Assessor guide: confirm that –

The person can give reasons for selecting particular information and explain why they have organised the information in the way that they have.

Criteria 1.1F.1.7

Verbal and written reporting undertaken where required.

Assessor guide: observe that –

Oral or written reports are given as required. For example, describe the outcomes of a service call, explain or write an incident/accident report and others.

Assessor guide: confirm that –

The person should be able to explain why they are reporting back, what the purpose of the report is. Characteristics of a good report, oral or written, can be given.

Criteria 1.1F.1.8

Communication is demonstrated in both familiar and unfamiliar situations and to familiar and unfamiliar individuals and groups.

Assessor guide: observe that –

The person has communicated successfully in situations where they are dealing with people that they are familiar with and those that are not familiar with. The situations should include communication with individuals and groups.

Assessor guide: confirm that –

The person can describe strategies to follow when speaking to individuals and groups and in situations where they are familiar with the people and where they are not.

Element 1.1F.2 Take part in group discussion to achieve appropriate work outcomes**Criteria 1.1F.2.1**

Responses sought and provided to others in the group.

Assessor guide: observe that –

The person gives clear, accurate and appropriate responses to others in a group. Information is sought from others using questioning techniques appropriate for the person from whom the information is requested and giving feedback to the person supplying the information.

Assessor guide: confirm that –

Appropriate principles to guide communication in groups can be given, such as everyone should have an opportunity to speak, people should be listened to and not interrupted and so on a number of questioning techniques can be identified.

Criteria 1.1F.2.2

Constructive contributions are made in terms of the production process involved.

Assessor guide: observe that –

Contributions to the group discussions are constructive, for example, other members of the group are listened to, opinions and comments are given in positive terms.

Assessor guide: confirm that –

The characteristics of constructive input to a discussion can be described.

Criteria 1.1F.2.3

Goals and aims are communicated.

Assessor guide: observe that –

Goals and aims are identified. Appropriate methods of communicating goals and aims are selected. They are communicated to others so that they are understood, and the receiver of the communication is able to restate them accurately.

Assessor guide: confirm that –

Appropriate ways of communicating goals and aims can be listed. Reasons for use of a particular method can be given.

Element 1.1F.3 Represent views of group to others**Criteria 1.1F.3.1**

Views, opinions of others are understood and reflected accurately.

Assessor guide: observe that –

The person is able to restate accurately the views of others as they are expressed in a group discussion. Good listening techniques are used when others are expressing their opinions.

Assessor guide: confirm that –

The reasons why it is necessary to restate the view of others accurately can be given.

Range statement

This unit covers competencies needed for situations where employees must collectively undertake a task eg: three or four assemblers co-operating to assemble a product, a trades person who has to attend a service call, or a group of process workers who undertake a similar task in close proximity to each other. This unit assumes that the group has not been formally designated as a permanent cohesive work unit by management. The performance criteria assume that any of the following techniques could be used as the subject of communication in this unit, for example: sketches, drawings, production schedules; written machine or job instructions; client instructions. It is assumed that the application of this unit in most workplaces would require a basic level of ability in speaking, reading and writing English as well as basic numeracy. Basic numeracy means the ability to perform simple arithmetic using whole numbers applying the four basic rules of addition, subtraction, multiplication and division. The unit however does not refer to competence in English but in communication. English language ability should be professionally assessed.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or a combination of both on and off the job. The communication activities undertaken should be consistent with the individual's field of work and be based on interaction with others related to workplace tasks and procedures, tools, equipment, materials and documentation relevant to that field of work. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. Assessment should be conducted in an environment that the individual is familiar with.

Critical aspects

This unit should be assessed in conjunction with other specialisation or core units and not in isolation. The assessment should be linked with performance of normal workplace activities where the competency covered by this unit is demonstrated concurrently with other core or specialisation competencies. The communication tasks may be related to any aspect of the job, interacting with team members, receiving instructions, reporting and any other activity which requires communication with individuals or groups.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Perform the tasks described by this guide, within a time frame established between the candidate's supervisor/instructor and the assessor, prior to undertaking this assessment. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures.

Unit MEM 1.2F A Apply principles of occupational health and safety in work environment

Band – Foundation

Field – Foundation

Unit Weight 0

This unit covers the competencies needed to follow safe working practices in the workplace. Competencies include interpreting safety signs and symbols, identifying and reporting actual and potential hazards and following emergency procedures.

Element 1.2F.1 Follow safe work practices

Criteria 1.2F.1.1

Work is carried out safely and in accordance with company policy and company procedures and legislative requirements

Assessor guide: observe that –

Safe working practices are followed in carrying out all workplace activities

Assessor guide: confirm that –

Safety working practices relating to all the tasks being undertaken in the workplace can be described Company policy and legislative requirements relating to all workplace activities can be identified and the relevance to the individual's work described

Criteria 1.2F.1.2

Housekeeping is undertaken in accordance with company procedures

Assessor guide: observe that –

The workplace is maintained in a safe and clean condition, following company procedures

Assessor guide: confirm that –

The reasons for good housekeeping in the workplace can be given The company requirements can be described

Criteria 1.2F.1.3

Responsibilities and duties of employees are understood and demonstrated in day to day actions

Assessor guide: observe that –

Workplace activities are carried out in accordance with the responsibilities and duties of employees, such as working safely, not endangering others, following company and legislative requirements, following procedures for handling dangerous substances and so on

Assessor guide: confirm that –

Responsibilities and obligations of employees can be given

Criteria 1.2F.1.4

Personal protective equipment is worn and stored according to company procedures

Assessor guide: observe that –

Appropriate personal protective equipment for the task is selected Personal protective equipment according to company procedures is worn and stored appropriately after use

Assessor guide: confirm that –

Reasons for use of personal protective equipment can be given

Criteria 1.2F.1.5

All equipment and safety devices are used according to legislative requirements and company/manufacture's procedures

Assessor guide: observe that –

When carrying out workplace activities, all appropriate safety equipment and devices are used in accordance with legislative and company/manufacture's requirements

Assessor guide: confirm that –

Appropriate equipment and safety devices for particular workplace tasks and activities can be selected The reasons for using safety equipment and devices can be

Criteria 1.2F.1.6 Safety signs/symbols are identified and followed as per instruction	<i>Assessor guide: observe that –</i> Work is carried out in accordance with the information given by safety signs and symbols	<i>Assessor guide: confirm that –</i> The signs and symbols can be correctly interpreted The application of the signs and symbols to their own work activities can be described
Criteria 1.2F.1.7 All manual handling is carried out in accordance with legal requirements, company procedures and National Occupational Health & Safety Commission guidelines	<i>Assessor guide: observe that –</i> Manual handling is carried out in accordance with the principles laid down in legislation, company procedures and National Health and Safety Commission guidelines	<i>Assessor guide: confirm that –</i> Correct procedures for manual handling can be explained The situations in which these procedures apply to their own workplace activities can be identified
Criteria 1.2F.1.8 Emergency equipment identified and appropriate use demonstrated	<i>Assessor guide: observe that –</i> Correct use of emergency equipment can be demonstrated	<i>Assessor guide: confirm that –</i> Location of emergency equipment can be given The type of emergency equipment to be used in specific situations can be identified The reasons for selecting a particular type of equipment can be given
Element 1.2F.2 Report workplace hazards		
Criteria 1.2F.2.1 Workplace hazards identified during course of work and reported to appropriate person according to standard operating procedures	<i>Assessor guide: observe that –</i> Workplace hazards encountered in the course of daily activities are noted, and reported to personnel according to standard operating procedures	<i>Assessor guide: confirm that –</i> Hazards which may be encountered in the workplace can be listed Procedures for reporting hazards can be given
Element 1.2F.3 Follow emergency procedures		
Criteria 1.2F.3.1 Means of contacting the appropriate personnel and emergency services in the event of an accident demonstrated	<i>Assessor guide: observe that –</i> Procedures for contacting appropriate personnel and emergency services in the event of an accident are demonstrated	<i>Assessor guide: confirm that –</i> Persons or services to be contacted in the event of a range of accidents can be listed (burns, poisons, broken limbs, eye accidents, spills, explosions, falls, electrical accidents and so on) Means of communication with emergency personnel can be listed Procedures and reasons for adopting standard procedures can be given
Criteria 1.2F.3.2 Emergency and evacuation procedure understood and carried out when required	<i>Assessor guide: observe that –</i> Emergency and evacuation procedures are demonstrated Emergency and evacuation procedures followed if required	<i>Assessor guide: confirm that –</i> Reasons for following emergency procedures can be explained Emergency and evacuation procedures (including isolation of equipment, for example - electrical, mechanical, hydraulic, steam, water gas and so on) can be described
Criteria 1.2F.3.3 Company evacuation procedures followed in case of an emergency	<i>Assessor guide: observe that –</i> If an emergency occurs, emergency procedures are followed	<i>Assessor guide: confirm that –</i> Reasons for the company to establish standard evacuation procedures can be given Company evacuation procedures can be described

Range statement

This Occupational Health and Safety (OHS) unit applies to safe working practices as applied to all metal and engineering workplaces. Competencies would be demonstrated associated with performance of duties and use of specialist skills. Emergency procedures may include the isolation of electrical, mechanical, hydraulic, pneumatic and emergency steam and water equipment as appropriate. This unit and these standards do not cover the skills of emergency teams such as fire fighting, first aid officer etc.

Evidence guide**Assessment context**

This unit may be assessed on the job, off the job, or a combination of on and off the job. Aspects of this unit will need to be assessed in a work situation. The context in which the OH & S principles are applied should be consistent with the individual's field of work and relate to procedures, tools equipment, materials and documentation relevant to that field of work. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. Assessment should be conducted in an environment that the individual is familiar with.

Critical aspects

This unit should be assessed in conjunction with other specialisation or core units and not in isolation. The assessment should be linked with performance of normal workplace activities where the competency covered by this unit is demonstrated concurrently with other core or specialisation competencies required by the individual's field of work.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Perform the tasks described by this guide, within a time frame established between the candidate's supervisor/instructor and the assessor, prior to undertaking this assessment. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. - Satisfy the assessor that the candidate can competently and consistently perform all required tasks and has a genuine knowledge of all the required criteria in this unit.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work: - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification - use accepted engineering techniques, practices, processes and workplace

Unit MEM 1.3F A Apply quality procedures

Band – Foundation

Field – Foundation

Unit Weight 0

Element 1.3F.1 Take responsibility for own quality

Criteria 1.3F.1.1

Concept of supplying product or service to meet the customer requirements (internal and external) understood and applied.

Assessor guide: observe that –

Workplace activities undertaken to within an appropriate time frame and so that they meet the quality specification of the internal and external customers.

Assessor guide: confirm that –

The concept of internal and external customers can be explained. Internal customers can be identified and their requirements described. The effects of not meeting their needs can be explained. External customers can be identified and their requirements described. The effect of not meeting their needs can be explained.

Criteria 1.3F.1.2

Interprets taking responsibility for own quality as a practical concept eg: "right first time".

Assessor guide: observe that –

All workplace activities undertaken by the individual are performed to the standards of quality required by the enterprise. If workplace activities do not meet the quality requirements (right first time, produced within the timeframe and so on), appropriate steps are taken to remedy this situation.

Assessor guide: confirm that –

Quality requirements for the person's own job can be explained. The reasons for ensuring that their own work meets the quality requirements can be given. The effects on the company if workers do not take responsibility for their own quality can be explained.

Element 1.3F.2 Apply standard procedures of workplace quality to own job

Criteria 1.3F.2.1

Quality system procedures followed.

Assessor guide: observe that –

Quality procedures are followed in all tasks undertaken.

Assessor guide: confirm that –

Company quality system procedures can be described. Quality system procedures applying to their own job can be explained.

Criteria 1.3F.2.2

Conformance to specifications ensured.

Assessor guide: observe that –

All workplace activities are undertaken so that products and processes conform to specifications. All work is checked to see that it does meet specifications. If products or processes do not meet specifications, appropriate action is taken.

Assessor guide: confirm that –

Specifications for products and processes can be identified. Methods of checking that specifications are met, can be given. Reasons why it is important to meet specifications can be given. Appropriate actions to take in cases where specifications are not met can be listed (for example, action to remedy routine problems, reporting to appropriate person, and others).

Range statement

This competency is applied to an individual's own work position.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or using a combination of on and off the job assessment. Aspects of this unit need to be assessed in a work situation. The application of quality procedures should be to the individual's own work and relate to procedures, production, equipment, materials and documentation relevant to that field of work. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. Assessment should be conducted in an environment that the individual is familiar with.

Critical aspects

This unit should be assessed in conjunction with other specialisation or core units and not in isolation. The assessment should be linked with performance of normal workplace activities where the competency covered by this unit is demonstrated concurrently with other core or specialisation competencies. This unit could be assessed in with any core or specialisation unit in which quality procedures are applied to the individual's workplace tasks.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to : - Orally, or by other methods of communication, answer questions put by the assessor. - Perform the tasks described by this guide, within a time frame established between the candidate's supervisor/instructor and the assessor, prior to undertaking this assessment. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. - Satisfy the assessor that the candidate can, competently and consistently perform all required tasks and has a genuine knowledge of all required criteria in this unit.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures.

Unit MEM 1.4F A Plan to undertake a routine task

Band – Foundation

Field – Foundation

Unit Weight 0

Element 1.4F.1 Identify task requirements

Criteria 1.4F.1.1

Instructions as to procedures are obtained, understood and where necessary clarified.

Assessor guide: observe that –

Instructions for tasks are obtained from correct source of information (job card, supervisor, manager/team leader, computer, filing system and others). Clarification sought from appropriate personnel where necessary.

Assessor guide: confirm that –

Correct sources of information for a particular task are selected. Procedures for obtaining instructions and clarification procedures can be described.

Criteria 1.4F.1.2

Relevant specifications for task outcomes are obtained, understood and where necessary clarified.

Assessor guide: observe that –

Relevant specifications are identified from documentation, job cards, manager, or other information source. Specifications are clarified where necessary.

Assessor guide: confirm that –

Specifications for the job can be given based on the information obtained. The reasons why it is necessary to have correct specifications can be given.

Criteria 1.4F.1.3

Task outcomes are identified.

Assessor guide: observe that –

Task outcomes are identified from documentation, job cards, manager, or other information source. Task outcomes are clarified where necessary.

Assessor guide: confirm that –

Task outcomes can be accurately described from documentation or information obtained. Reasons why it is important to clarify task outcomes can be given.

Criteria 1.4F.1.4

Task requirements such as completion time and quality measures are identified.

Assessor guide: observe that –

Task requirements accessed from documentation, job cards, manager, or other information source. Requirements are clarified where necessary.

Assessor guide: confirm that –

The requirements, such as completion time, quantity, quality procedures and others, can be described based on the information obtained.

Element 1.4F.2 Plan steps required to complete task**Criteria 1.4F.2.1**

Based on instructions and specifications provided, the individual steps or activities required to undertake the task are understood and where necessary clarified.

Assessor guide: observe that –

Plans for tasks are prepared. Where necessary, requirements clarified from appropriate sources.

Assessor guide: confirm that –

Reasons for preparing a plan can be given. Steps or activities in the plan can be described.

Criteria 1.4F.2.2

Sequence of activities required to be completed is identified in plan.

Assessor guide: observe that –

Activities in the plan put in a logical sequence.

Assessor guide: confirm that –

Reasons for arranging the activities in that order can be given.

Criteria 1.4F.2.3

Planned steps and outcome are checked to ensure conformity with instructions and relevant specifications.

Assessor guide: observe that –

Planned steps and outcomes are checked against the instructions and specifications.

Assessor guide: confirm that –

Reasons why it is important to check the plan against the instructions and specifications can be given.

Element 1.4F.3 Review plan**Criteria 1.4F.3.1**

Outcomes are identified and compared with (planned) objectives, task instructions, specifications and task requirements.

Assessor guide: observe that –

Identified outcomes are compared with planned activities to ensure that activities are carried out in line with instructions, and that task requirements and specifications are complied with.

Assessor guide: confirm that –

Reasons for this final check of outcomes against requirements and specifications can be given.

Criteria 1.4F.3.2

If necessary, plan is revised to better meet objectives and task requirements.

Assessor guide: observe that –

Plan is revised if necessary.

Assessor guide: confirm that –

Reasons for changes to the plan can be given, and the person can explain why the changed plan better meets the objectives and task requirements.

Range statement

Instructions, such as standard operation sheets, are provided. Clear specifications and requirements, including quality and time allowances are also provided. The task and associated planning activity are carried out under supervision. The plan may or may not be documented. The task involves one or more steps or functions carried out routinely on a regular basis. The planning activity does not require the exercise of judgement as to priorities or time limitations, it requires that precise information provided in the instructions be accurately followed, steps in the process be completed in the appropriate sequence and that the time limits specified are met.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or a combination of both on and off the job. The planning should be consistent with the individual's field of work and relate to procedures, tools, equipment, materials and documentation relevant to that field of work. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. Assessment should be conducted in an environment that the individual is familiar with.

Critical aspects

This unit should be assessed in conjunction with other specialisation or core units and not in isolation. The assessment should be linked with performance of normal workplace activities where the competency covered by this unit is demonstrated concurrently with other core or specialisation competencies. The assessment of this competency may be associated with the assessment of core or specialist units that require planning for undertaking a routine task in the individual's field of work.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Perform the tasks described by this guide, within a time frame established between the candidate's supervisor/instructor and the assessor, prior to undertaking this assessment. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. - Satisfy the assessor that the candidate can competently and consistently perform all required tasks and has a genuine knowledge of all the required criteria in this unit.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures.

Unit MEM 2.1C12 A Apply quality systems

Band – Core

Field – Core

Unit Weight 2

Element 2.1C12.1 Understand and follow standard operational or specification requirements

Criteria 2.1C12.1.1

Follows instructions/performs duties within a quality improvement system.

Assessor guide: observe that –

Where appropriate, the job or work instructions are obtained in accordance with workplace procedures. The individual's work is carried out in accordance with standard operating procedures.

Assessor guide: confirm that –

The work to be undertaken can be identified. The duties of the individual within the quality improvement system can be identified. The reasons for following the requirements of the quality improvement system can be explained. The procedures to be followed in undertaking the work can be identified.

Criteria 2.1C12.1.2

Ensures conformance to specifications.

Assessor guide: observe that –

Where appropriate, the specifications pertaining to the individual's work are obtained in accordance with workplace procedures. The individual's work conforms to specifications.

Assessor guide: confirm that –

The specifications to which the individual's work is to comply can be identified. The reasons for ensuring that the individual's work conforms to specification can be given.

Criteria 2.1C12.1.3

Defects detected and reported according to standard operating procedures.

Assessor guide: observe that –

Where appropriate, defects detected are reported in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for reporting defects can be identified. Examples of common defects can be given.

Criteria 2.1C12.1.4

Performance of operation or quality of product or service to ensure customer satisfaction monitored.

Assessor guide: observe that –

Assessor guide: confirm that –

The individual's customers can be identified. The customers' requirements with respect to the operation or quality of the product or service can be identified. The ways in which customer satisfaction is determined can be given.

Element 2.1C12.2 Engages in quality improvement**Criteria 2.1C12.2.1**

Process improvement procedures participated in.

Assessor guide: observe that –

The individual's work is carried out in accordance with the process improvement procedures.

Assessor guide: confirm that –

The process improvement procedures can be identified. The reasons for following process improvement procedures can be given.

Criteria 2.1C12.2.2

Participates in the improvement of internal/external, customer/supplier relationships.

Assessor guide: observe that –

The individual's work is carried out in a manner consistent with the improvement of customer/supplier relationships.

Assessor guide: confirm that –

Examples of ways in which customer/supplier relationships can be improved can be given. The benefits of good customer/ supplier relationships can be given.

Range statement

Standards are applicable for any work within a quality improvement system either individually or in a team situation. The definition of customer is wide and applies to the next person or organisation receiving the production or service. Operation or specification requirements include quality inspection of own or other employee's work up to the level of the employees technical competence.

Range Name	Description
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Evidence guide

Assessment context

This unit should be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Critical aspects

This unit could be assessed in conjunction with any other units associated with the individual's work or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 2.2C11 A Organise and analyse information

Band – Core

Field – Core

Unit Weight 2

Element 2.2C11.1 Access information and/or records

Criteria 2.2C11.1.1

Information requirements of tasks are determined and relevant information is accessed from a range of sources including computer terminals, tables, technical manuals and/or charts, operational instructions.

Assessor guide: observe that –

The relevant information is accessed from a range of sources in accordance with standard operating procedures.

Assessor guide: confirm that –

The information to be accessed can be identified. The source(s) from which the information is to be accessed can be given. The reasons for selecting the chosen source(s) of information can be given. The procedures for accessing the required information from the chosen source(s) can be given.

Criteria 2.2C11.1.2

Accessed information is interpreted correctly and/or recorded.

Assessor guide: observe that –

Where appropriate, the accessed information is recorded in accordance with standard operating procedures.

Assessor guide: confirm that –

The accessed information is interpreted correctly. Where appropriate, the procedures for recording the accessed information can be given.

Element 2.2C11.2 Give verbal and/or written reports

Criteria 2.2C11.2.1

Simple verbal or written reports prepared and given in accordance with workplace procedures.

Assessor guide: observe that –

Simple reports are prepared and given in accordance with workplace procedures.

Assessor guide: confirm that –

The topic(s) to be covered by the report can be identified. Where appropriate, the relevant forms/proformas to be used in the preparation of the report can be identified. The procedures for preparing/presenting simple reports in the work place can be given. The reasons for preparing and presenting the report can be given.

Criteria 2.2C11.2.2

Give verbal and/or written feedback.

Assessor guide: observe that –

The individual provides appropriate and timely feedback to those presenting reports or providing information.

Assessor guide: confirm that –

The reasons for providing feedback to those initiating reports and/or providing information can be given. The benefits of providing timely feedback to those initiating reports and/or providing information can be explained.

Range statement

This unit applies to the accessing and recording of information from a variety of sources including data associated with the operation of just-in-time and KANBAN systems. This unit also covers access and recording of electronically stored data where systems knowledge and judgement are not required eg. barcoding and simple keyboard operations. For access and recording of data requiring system knowledge and judgement see Unit 2.9C10 (Perform computer operations). Reports under element include breakdown reports, KANBAN cards, production/material problems, work improvement suggestions, quality circle participation suggestions/reports to clients, shift production schedules etc. A simple report would be a report on one or two topics. It would be short and it would not require in-depth analysis. It is assumed that the application of this unit in most workplaces would require a basic level of ability in speaking, reading and writing English as well as basic numeracy. The unit however does not refer to competence in English but in communication. English language ability should be professionally assessed.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the organisation and analysis of information or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 2.3C11 B Operate in a work based team environment

Band – Core

Field – Core

Unit Weight 2

Element 2.3C11.1 Determine team role and scope

Criteria 2.3C11.1.1

The role and scope of the team identified from available information.

Assessor guide: observe that –

Where appropriate, job or work instructions obtained in accordance with workplace procedures. Where appropriate, all relevant drawings, specifications, manuals, codes, standards, catalogues etc. are obtained in accordance with workplace procedures.

Assessor guide: confirm that –

The work to be undertaken by the team can be identified. The team's internal/external customers and suppliers can be identified. The products/service to be received from the team's suppliers can be identified. The products/service to be provided to the team's customers can be identified.

Criteria 2.3C11.1.2

Team parameters, reporting relationships and responsibilities identified from team discussions and appropriate external sources.

Assessor guide: observe that –

The individual participates in team discussions related to the team's work. Where appropriate, information relating to the team's responsibilities and reporting relationships is obtained from relevant sources external to the team.

Assessor guide: confirm that –

The team's reporting relationships can be identified. The team's responsibilities with respect to products/services to be provided can be identified. The limits within which the team is to operate can be identified. The sources external to the team from which information relevant to the team's work may be obtained can be identified. The sources of technical expertise/ assistance external to the team can be identified.

Element 2.3C11.2 Identify own role and responsibility within team

Criteria 2.3C11.2.1

Own role and responsibilities within the team environment identified.

Assessor guide: observe that –

Assessor guide: confirm that –

The individual's role and responsibilities within the team can be given.

Criteria 2.3C11.2.2

Roles and responsibility of other team members identified and recognised.

Assessor guide: observe that –

Assessor guide: confirm that –

The roles and responsibilities of the other team members can be identified.

Criteria 2.3C11.2.3

Reporting relationships within team and external to team identified.

Assessor guide: observe that –

Assessor guide: confirm that –

The reporting relationships within the team can be identified. The reporting relationships external to the team can be identified. The procedures for obtaining information and/or technical assistance from sources external to the team can be given.

Element 2.3C11.3 Plan team activities**Criteria 2.3C11.3.1**

Contribute to development of team work plans based on understanding of role and parameters of team and own skills and competencies.

Assessor guide: observe that –

The individual makes a contribution to the team's work planning procedures.

Assessor guide: confirm that –

The procedures for planning the team's work can be given. The skills and competencies of the individual and other team members can be identified. The effects on team performance of assigning tasks to team members without the appropriate skills and competencies required to carry out those tasks can be given.

Element 2.3C11.4 Operate as team member**Criteria 2.3C11.4.1**

Effective and appropriate forms of communication used and interactions undertaken with team members which contribute to known team activities and objectives.

Assessor guide: observe that –

The individual communicates effectively and appropriately with other team members.

Assessor guide: confirm that –

The team's activities and objectives can be identified. Examples of inappropriate forms of communication within the team can be given. The reasons for using appropriate forms of communication in a team environment can be explained.

Criteria 2.3C11.4.2

Effective and appropriate contributions made to complement team activities and objectives, based on own skills and competencies.

Assessor guide: observe that –

The individual demonstrates the full extent of skills and competencies held and required in performing assigned tasks within the team.

Assessor guide: confirm that –

The skills and competencies required to carry out specified tasks within the team can be identified.

Criteria 2.3C11.4.3

Team agreed reporting lines followed using standard operating procedure.

Assessor guide: observe that –

The individual follows agreed reporting lines in accordance with standard operating procedures.

Assessor guide: confirm that –

The reporting lines to be followed can be identified. The reporting procedures can be given.

Range statement

This unit applies to the skills necessary for participation in small and dedicated work team environments, including active participation in structured team meetings. Individual team members are not responsible for the overall performance of the team but contribute to team activities and objectives using their own existing technical competencies. Identification of own role and responsibilities within the team is based on predetermined, readily available information. Role of team is of a dedicated and predetermined nature and would have available external technical and management support.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the work of the team or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 2.4C11 A Assist in the provision of on the job training

Band – Core

Field – Core

Unit Weight 2

Element 2.4C11.1 Determine role of on the job training

Criteria 2.4C11.1.1

Objectives of training and role identified and understood in consultation with team leaders or other appropriate personnel.

Assessor guide: observe that –

All relevant information with respect to the training to be provided is obtained in accordance with work place procedures.

Assessor guide: confirm that –

The training to be delivered can be identified. The personnel to be consulted with respect to the training to be provided can be identified. The individual's role in the provision of training can be explained. The objectives of the training to be provided can be identified. The person(s) to be trained can be identified. The procedures to be followed when training individuals can be given.

Element 2.4C11.2 Provide on the job training

Criteria 2.4C11.2.1

Training conducted using suitable methods eg: explanation, demonstration using standard operating procedures.

Assessor guide: observe that –

Suitable training methods are used in providing the required training.

Assessor guide: confirm that –

The location(s) at which the training is to be provided can be identified. All tools, equipment, procedures, materials and resources required to achieve the training objectives can be identified. Examples of appropriate training delivery methods can be given. The reasons for selecting the chosen delivery method(s) can be explained.

Criteria 2.4C11.2.2

Trainee progress monitored and appropriate feedback provided using standard operating procedures.

Assessor guide: observe that –

Appropriate feedback is provided to the trainee throughout the training process in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for providing feedback to the trainee(s) can be given. The reasons for monitoring trainee progress can be explained. The reasons for giving positive feedback to the trainee at all times can be explained.

Element 2.4C11.3 Report on trainee performance**Criteria 2.4C11.3.1**

Trainee's progress reported according to standard operating procedure.

Assessor guide: observe that –

The trainee's progress is reported in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for reporting trainee progress can be given. The skills satisfactorily achieved by the trainee can be identified. The skills requiring more practice by the trainee can be identified.

Range statement

This unit applies where an employee assists in the provision of on the job training to others while undertaking his/her own normal duties, this may involve the replacement of normal duties with training duties for limited periods of time. The individual would not be expected to be solely responsible for the assessment or reporting of a trainee's progress. Reporting procedures should include information about the skills satisfactorily achieved and those where further practice is required. Typical applications could include the provision of on-the-job guidance by a tradesperson to apprentices/trainees or by a production worker to other production workers/trainees. Where development of training programs is involved see Unit 17.1A (Assist in development and deliver training in the workplace).

Evidence guide

Assessment context

This unit should be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 2.5C11 A Measure with graduated devices

Band – Core

Field – Core

Unit Weight 2

Element 2.5C11.1 Use a range of graduated devices to measure/determine dimensions or variables

Criteria 2.5C11.1.1

Selects appropriate device or equipment to achieve required outcome.

Assessor guide: observe that –

The appropriate measuring device can be selected from a range of measuring devices for given measuring tasks.

Assessor guide: confirm that –

The correct application of a range of measuring devices can be identified. The reasons for selecting the chosen measuring device for each of a number of given measuring tasks can be given.

Criteria 2.5C11.1.2

Correct and appropriate measuring technique used.

Assessor guide: observe that –

For each measuring device selected the correct and appropriate measuring technique is used.

Assessor guide: confirm that –

The correct and appropriate measuring technique for a range of measuring devices can be identified. The consequences of not using the correct and appropriate measuring techniques for given measuring devices can be explained.

Criteria 2.5C11.1.3

Measures accurately to finest graduation of instrument.

Assessor guide: observe that –

All measurements taken are read accurately to the finest graduation of the selected measuring device.

Assessor guide: confirm that –

The accuracy to which a variety of measuring instruments can be read can be identified. The effect of using inappropriate measuring devices or measuring techniques on the accuracy of the measurements taken can be explained.

Element 2.5C11.2 Maintain graduated devices**Criteria 2.5C11.2.1**

Routine care and storage of devices undertaken to manufacturer's specification or standard operating procedure.

Assessor guide: observe that –

All measuring devices are handled and stored in accordance with manufacturers' specifications or standard operating procedures.

Assessor guide: confirm that –

The procedures for handling and storing a range of measuring devices can be given. The effect of inappropriate use, handling and/or storage on the accuracy of measuring devices can be explained.

Criteria 2.5C11.2.2

Checks and makes routine adjustments to devices eg: "zeroing".

Assessor guide: observe that –

All measuring devices are checked for zero before use in accordance with standard operating procedures. Where appropriate, routine adjustments are made to measuring devices in accordance with standard operating procedures.

Assessor guide: confirm that –

The routine adjustments that can be made to a range of measuring devices can be identified. The procedures for adjusting and zeroing a range of measuring devices can be given. The procedures for checking a range of measuring devices for accuracy and correct operation can be given.

Range statement

Work undertaken autonomously or part of team environment. Work undertaken in field, work station, workshops. This unit covers measurement skills requiring straightforward application of the measuring device and may utilise the full range of graduations of measuring device. Examples may include measurements using verniers, feeler gauges, micrometers, dial indicators, thermometers, and similar graduated devices. Measurements undertaken may include: length, squareness, flatness, angle, roundness, clearances or any other measurements that can be read off analog, digital or other graduated device. Electrical/electronic devices used are those not requiring the connection or disconnection of circuitry. Measurements may include metric and imperial measurement. All measurements undertaken to standard operating procedures. Adjustment of measuring devices is through external means and includes zero and linear adjustment. For straightforward use of comparison or basic measuring devices Unit 12.1A (Use comparison and basic measuring devices) should be accessed.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the use of graduated measuring devices or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 2.6C10 A Plan a complete activity

Band – Core

Field – Core

Unit Weight 4

Element 2.6C10.1 Identify activity requirements

Criteria 2.6C10.1.1

Instructions as to objectives and performance requirements are obtained, understood and where necessary clarified.

Assessor guide: observe that –

Instructions are obtained in accordance with work site procedures.

Assessor guide: confirm that –

The tasks to be performed can be identified. The person(s) who can clarify the objectives/performance requirements can be identified.

Criteria 2.6C10.1.2

Relevant specifications for activity outcomes are obtained, understood and where necessary clarified.

Assessor guide: observe that –

Specifications relevant to the tasks to be performed are obtained in accordance with work site procedures.

Assessor guide: confirm that –

The specifications relevant to the tasks to be performed can be identified. The person(s) who can clarify issues relating to specifications can be identified.

Criteria 2.6C10.1.3

Activity outcomes are identified.

Assessor guide: observe that –

Assessor guide: confirm that –

The outcomes to be achieved at the completion of the activity can be identified.

Criteria 2.6C10.1.4

Activity requirements, including overall timeframe for activity, quality requirements and criteria for acceptable completion are identified.

Assessor guide: observe that –

Assessor guide: confirm that –

The timeframe in which the activity is to be completed can be identified. The quality requirements of the product or service to be provided can be identified.

Element 2.6C10.2 Plan process to complete activity**Criteria 2.6C10.2.1**

Based on instructions as to objectives, performance requirements and specifications, the individual components of the activity are identified and prioritised.

Assessor guide: observe that –

A plan is prepared including sequential steps that will enable the activity to be completed.

Assessor guide: confirm that –

The priority of each step in the plan can be identified.
The reasons for the relative priority of each step can be given.

Element 2.6C10.3 Modify plan**Criteria 2.6C10.3.1**

Plan if necessary may be modified to overcome unforeseen difficulties or developments that occur as work progresses.

Assessor guide: observe that –

Where appropriate the plan is modified to take account of difficulties or developments that occur while following the prepared plan.

Assessor guide: confirm that –

Modifications to the plan to overcome a range of unforeseen situations can be given.

Range statement

Instructions may include timeframe, quality requirements, outcome requirements and performance requirements. Instructions carried out in accordance with established procedures. However, the activities may require a response and modification of procedures or choice of different procedures to deal with unforeseen developments. The activity may require prioritising of the individual components to facilitate the meeting of the objectives. Examples of activities to be planned may include: fault diagnosis and repair of an item of equipment, a modification of an established sequence of assembly tasks. Activities are normally performed by the individual undertaking the planned activity and associated reports are completed as required. Instructions refer to either formal or informal information about the task required. Planning will be related to familiar work tasks and environments and be performed to standard operating procedures. Where more extensive reporting requiring research and forming conclusions is required refer Unit 2.10 C5 (Write reports).

Evidence guide

Assessment context

This unit should be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with other units addressing the safety, quality, communication, materials handling, recording and reporting associated with hand forging or other units requiring the exercise of skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment, the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities.

Unit MEM 2.7C10 A Perform computations (basic)

Band – Core

Field – Core

Unit Weight 2

This unit covers the competencies for performing computations in relation to measurement, statistical application or interpretation of drawings and diagrams. Basic numeracy skills are assumed. (Basic numeracy means the ability to perform simple arithmetic using whole numbers applying the four basic rules of addition, subtraction, multiplication and division.)

Element 2.7C10.1 Applies four basic rules of calculation

Criteria 2.7C10.1.1

Simple calculations are performed using four basic rules, addition, subtraction, multiplication and division.

Assessor guide: observe that –

Calculations involving whole numbers can be correctly performed using all four basic rules.

Assessor guide: confirm that –

Examples of the application of each of the four rules of calculation performed in the workplace can be given.

Criteria 2.7C10.1.2

Understands concept of and performs simple calculations involving length, perimeter, area and volume.

Assessor guide: observe that –

Calculations involving length, perimeter, area and volume can be correctly performed.

Assessor guide: confirm that –

The formula applicable to the determination of perimeter, area and volume of simple geometric shapes can be identified from given information. The reasons for using dimensions with the same units when calculating length, perimeter, area and volume can be given. The concepts of perimeter, area and volume can be explained.

Element 2.7C10.2 Performs basic calculations involving fractions and decimals

Criteria 2.7C10.2.1

Simple calculations are performed involving fractions and mixed numbers using four basic rules.

Assessor guide: observe that –

Workplace calculations involving fractions and mixed numbers can be correctly performed using all four basic rules.

Assessor guide: confirm that –

Mixed numbers, fractions and whole numbers can be identified from a given list. The procedures for carrying out calculations involving fractions and using each of the four basic rules can be given.

Criteria 2.7C10.2.2

Simple calculations are performed involving decimal fractions and mixed numbers using four basic rules.

Assessor guide: observe that –

Workplace calculations involving decimals and mixed numbers can be correctly performed using all four basic rules.

Assessor guide: confirm that –

Mixed numbers, decimals and whole numbers can be identified from a given list. The procedures for carrying out calculations involving decimals and using each of the four basic rules can be given.

Range statement

Calculations may be performed using pen and paper or on a calculator. Computations performed in an appropriate application for the industry in which the person is working. Skills may be demonstrated in relation to measurement, statistical application or interpretation of drawings and diagrams. Basic numeracy skills below those described in this unit are not covered in these standards and are assumed to be held on entry to the industry. Basic numeracy means the ability to perform simple arithmetic using whole numbers applying the four basic rules of addition, subtraction, multiplication and division.

Evidence**Assessment context**

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the computations being performed or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 2.8C10 A Perform computations

Band – Core

Field – Core

Unit Weight 2

Pre-requisite units - Path 1

2.7C10 Perform computations - basic

Element 2.8C10.1 Estimates approximate answers

Criteria 2.8C10.1.1

Check calculated answers by estimating techniques.

Assessor guide: observe that –

Calculated answers are checked for accuracy.

Assessor guide: confirm that –

An appropriate technique for estimating approximate answers can be identified.

Criteria 2.8C10.1.2

Performs simple rounding off operations when estimating.

Assessor guide: observe that –

Estimated answers are appropriately rounded off.

Assessor guide: confirm that –

The procedures for rounding off figures when estimating approximate answers can be given.

Element 2.8C10.2 Performs basic calculations involving percentages

Criteria 2.8C10.2.1

Simple calculations are performed to obtain percentages from information expressed in either fractional or decimal format.

Assessor guide: observe that –

Information presented in fractional or decimal format can be expressed as a percentage.

Assessor guide: confirm that –

The concept of percentage can be explained. The procedures to be followed in converting a decimal to a percentage can be given. The procedures to be followed on converting a fraction to a percentage can be given.

Element 2.8C10.3 Applies the four basic rules to algebraic expression

Criteria 2.8C10.3.1

Simple calculations are performed on algebraic expressions using the four basic rules - addition, subtraction, multiplication, division.

Assessor guide: observe that –

The appropriate formulae are selected for the given application. The correct values are substituted for each term in the relevant formulae. The appropriate mathematical operations are used to determine the required value. Where appropriate, the known values are converted to units consistent with the formulae selected.

Assessor guide: confirm that –

The sources of appropriate formulae can be given. The reasons for ensuring that the units of each term are consistent with the formulae selected can be given. The procedures for converting given units to those required for use in formulae can be given.

Element 2.8C10.4 Performs basic calculations involving proportions**Criteria 2.8C10.4.1**

Simple calculations are performed involving ratios and proportion using whole numbers, fractions and decimal fractions.

Assessor guide: observe that –

Calculations involving ratios or proportions can be correctly performed.

Assessor guide: confirm that –

The concepts of ratio and proportion can be explained. Given ratios can be expressed in terms of whole numbers, fractions and decimal fractions. Given proportions can be expressed in terms of whole numbers, fractions and decimal fractions.

Criteria 2.8C10.4.2

Information extracted from charts and graphs is used as a basis for decision making.

Assessor guide: observe that –

Assessor guide: confirm that –

Element 2.8C10.5 Interpret charts and graphs**Criteria 2.8C10.5.1**

Information extracted from charts and graphs is interpreted correctly.

Assessor guide: observe that –

The required information can be determined from appropriate charts or graphs.

Assessor guide: confirm that –

The scales applicable to the axes of the graphs or charts can be correctly identified. Three types of charts and/or graphs used in the individual's field of work can be identified.

Criteria 2.8C10.5.2

Information extracted from charts and graphs is used as a basis for decision making.

Assessor guide: observe that –

Assessor guide: confirm that –

Where appropriate, upper and lower limits of acceptability applicable to data entered on a graph or chart can be identified. Where appropriate, the trends indicated by the slope or gradient of a graph can be identified. Where appropriate, the action to be taken when given trends occur or set limits are approached on graphs or charts can be identified.

Element 2.8C10.6 Produces charts and graphs from given information**Criteria 2.8C10.6.1**

Information is used to produce simple charts and graphs as required.

Assessor guide: observe that –

Simple charts or graphs are produced from given information or observations made. Appropriate scales are selected and used in the production of charts and graphs. Appropriate limits are clearly marked on the graph or chart. The axes are appropriately and correctly labelled. The coordinates are clearly and accurately marked.

Assessor guide: confirm that –

Three types of graph can be identified. The procedures for drawing "lines of best fit" can be given. The trends indicated by the graphs or charts drawn can be identified.

Range statement

Calculations may be performed using pen and paper or on a calculator. All problems should have appropriate applications depending on the workplace. Interpretation of charts and graphs would usually extend to simple histograms, control charts, pie charts, etc. Data may be generated from readings taken or computer generated. Applications can include computation of pressure, volume, temperature, heat, speed, density, mass, force, efficiency etc.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or a combination of both on and off the job. The computations to be performed should be consistent with the individual's field of work and relate to procedures, tools, equipment, materials and documentation relevant to that field of work. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the computations being performed or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will access have to : - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference material. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities.

Unit MEM 2.9C10 A Perform computer operations

Band – Core

Field – Core

Unit Weight 2

Element 2.9C10.1 Identify uses of computers in the workplace

Criteria 2.9C10.1.1

Principles of computer systems understood.

Assessor guide: observe that –

Assessor guide: confirm that –

The hardware components of a computer system and their function can be identified. The functions of both hardware and software can be given.

Criteria 2.9C10.1.2

Application of computers in the workplace correctly identified.

Assessor guide: observe that –

Assessor guide: confirm that –

Four applications of computers in the metal and engineering industry can be given.

Element 2.9C10.2 Access information using computer

Criteria 2.9C10.2.1

Correct program/application selected based on knowledge of computer system in accordance with standard operating procedure.

Assessor guide: observe that –

The program/application containing the information required is accessed in accordance with work site procedures.

Assessor guide: confirm that –

The program/application containing the required information can be identified.

Criteria 2.9C10.2.2

Required information identified and retrieved.

Assessor guide: observe that –

A hard copy of the required information is obtained in accordance with work site procedures. The information obtained is checked for conformance with the information requirements.

Assessor guide: confirm that –

Two consequences of not checking that the information obtained is the information required can be given.

Element 2.9C10.3 Input data correctly into computer**Criteria 2.9C10.3.1**

Data entered into computer.

Assessor guide: observe that –

The appropriate program/application into which data is to be entered is accessed in accordance with work site procedures. The data is entered into the computer in accordance with work site procedures.

Assessor guide: confirm that –

The program/application into which the data is to be entered can be identified.

Criteria 2.9C10.3.2

Accuracy of information checked and information saved in accordance with standard operating procedures.

Assessor guide: observe that –

The entered data is checked for accuracy. The entered data is saved in accordance with work site procedures.

Assessor guide: confirm that –

Two consequences of not checking entered data for accuracy can be given. Two consequences of not saving entered data can be given.

Element 2.9C10.4 Output data using computer system**Criteria 2.9C10.4.1**

Data processed using computer programs.

Assessor guide: observe that –

The entered data is processed using appropriate software commands.

Assessor guide: confirm that –

The function of relevant software commands can be identified.

Criteria 2.9C10.4.2

Data printed out as required using computer hardware/peripheral devices in accordance with standard operating procedure.

Assessor guide: observe that –

The processed data is checked for accuracy/format/spelling/completeness as appropriate. The appropriate output device is selected for the hard copy to be produced. The data is presented in an appropriate hard copy format.

Assessor guide: confirm that –

The reasons for checking data prior to printing can be given. Two examples of devices used to produce hard copy printouts can be given.

Criteria 2.9C10.4.3

Files, data transferred between compatible systems as required using computer software, hardware/peripheral devices where conversion skills are not required and data transfer is in accordance with standard operating procedure.

Assessor guide: observe that –

The files/data to be transferred is checked for accuracy/format/spelling/completeness as appropriate. The appropriate data transfer device(s)/procedure(s) are selected. The data is transferred accurately.

Assessor guide: confirm that –

The reasons for checking data/files prior to transfer can be given. Two examples of devices/procedures used to transfer data between systems can be given.

Range statement

This unit applies to the application of the skills where an understanding of computer principles and application of programs is required. Skills may be demonstrated where program knowledge and judgement is exercised in relation to maintenance of enterprise records; tracking of jobs/orders through an enterprise; accessing of information relating to inventory stores/prices/availability of components; access to drawings held on CAD (computer aided design) systems; the accessing of CNC (computer numerical control) information; files transferred to disk; printing output. This unit also covers the skills for routine downloading of programmable logic controller (PLC), CNC or NC programs via disk, tape or direct means. Where this downloading requires program, data adjustment or checks against specification then Unit 10.4A (Enter and change programmable controller operational parameters) should be selected. For access and recording of electronically stored data where program knowledge and judgement is not required see Unit 2.2C11 (Organise and analyse information).

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the computations being performed or other units requiring the exercise of the skills and knowledge covered by this unit.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant hardware and software manuals The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities.

Unit MEM 2.10C5 A Write reports

Band – Core

Field – Core

Unit Weight 2

Notes - This unit can be regarded as a Specialisation band A unit from C11 onwards

Pre-requisite units - Path 1

2.6C10 Plan a complete activity

Element 2.10C5.1 Communicate concepts in writing

Criteria 2.10C5.1.1

Reports are written using appropriate terminology where required.

Assessor guide: observe that –

The terminology and language used in the report is appropriate to the target audience.

Assessor guide: confirm that –

The report's intended audience can be identified. The consequences of using inappropriate terminology and language can be given.

Criteria 2.10C5.1.2

Reports discuss alternatives, difficulties and suggestions when required.

Assessor guide: observe that –

Where appropriate, the report includes alternative views, approaches and suggestions for consideration by the reader.

Assessor guide: confirm that –

The benefits of providing alternative approaches in a report can be given.

Criteria 2.10C5.1.3

Reports are coherent and based on any analysis or research undertaken.

Assessor guide: observe that –

The report is coherent and logical. Any recommendations/suggestions made are based on documented analysis or research undertaken.

Assessor guide: confirm that –

The benefits of documenting evidence to support recommendations/suggestions included in the report can be given.

Criteria 2.10C5.1.4

Conclusions are based on the facts in the report and recommendations are made if required.

Assessor guide: observe that –

Any conclusions are based on the facts presented in the report. Where appropriate, recommendations are made.

Assessor guide: confirm that –

The benefits of presenting conclusions based on facts contained in the report can be given.

Criteria 2.10C5.1.5

Reports are completed within specified time.

Assessor guide: observe that –

The report is completed within the specified time.

Assessor guide: confirm that –

The timeframe for the preparation of the report and the deadline for completion can be identified.

Criteria 2.10C5.1.6

References are acknowledged as required.

Assessor guide: observe that –

Where appropriate, references are acknowledged in the report.

Assessor guide: confirm that –

The details required to appropriately acknowledge references used in the preparation of reports can be identified.

Range statement

Report is used to denote any required written communication that goes beyond a simple recording of facts (such as completion of a pro forma shift production schedule) to include a level of analysis and/or research. Reports may be of a technical or non-technical nature. If the report is technical, it should be based on the writer having technical knowledge. Conclusions and/or recommendations where required are based on research or analysis of data. Reports include graphs, charts, tables, etc. as required. The analysis and conclusions should be consistent with the level of skill and knowledge of an employee working at that level. Simple analysis and research would be required.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units applicable to the individual's work. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant text, periodicals, reports, etc. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment, the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operation procedures - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities.

Unit MEM 2.11C5 A Research and prepare presentations and reports

Band – Core

Field – Core

Unit Weight 2

Notes - This unit can be regarded as a Specialisation band A unit from C11 onwards

Pre-requisite units - Path 1

2.2C11 Organise and analyse information

Element 2.11C5.1 Research information

Criteria 2.11C5.1.1

Research of existing materials is undertaken including reference books, tables, technical journals and internal/external databases.

Assessor guide: observe that –

Assessor guide: confirm that –

Relevant reference sources have been identified and accessed where appropriate. Relevant internal/external databases have been identified and accessed where appropriate. Relevant personnel have been consulted where appropriate.

Element 2.11C5.2 Analyse information

Criteria 2.11C5.2.1

Conclusions are reached that are logical and based on objective analysis of available data.

Assessor guide: observe that –

Conclusions are clearly stated and are consistent with the information/data contained in the report or presentation.

Assessor guide: confirm that –

The reasons for including information/data in the report or presentation can be given. All relevant information/data is included in the report or presentation. The effect of variations in the information/data obtained, on the conclusions reached can be identified.

Criteria 2.11C5.2.2

References are acknowledged as required.

Assessor guide: observe that –

References used in the preparation of the report or presentation are appropriately acknowledged.

Assessor guide: confirm that –

The reasons for acknowledging references utilised in the preparation of reports or presentations can be given. Appropriate methods of acknowledging references in reports or presentations can be identified.

Element 2.11C5.3 Summarise and organise technical data

Criteria 2.11C5.3.1

Materials and data prepared for presentation or report.

Assessor guide: observe that –

The materials required to support the presentation or report are prepared and of a standard and quality appropriate to the intended audience.

Assessor guide: confirm that –

Where appropriate, information and technical data to be presented have been summarised. The report or presentation is appropriately planned and sequenced.

Range statement

In this unit the employee may be preparing a presentation or report for another person or for themselves to deliver. Materials and documents mentioned are based on relevant knowledge of the employee competency level.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or a combination of both on and off the job. The report/presentation to be researched and prepared should relate to the individual's field of work and relate to equipment, procedures, processes, techniques and/or practices the individual is familiar with. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the subject of the report being researched and/or prepared for presentation or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 2.13C5 A Perform mathematical computations

Band – Core

Field – Core

Unit Weight 4

Notes - This unit can be regarded as a Specialisation band A unit from C11 onwards

Pre-requisite units - Path 1

2.7C10 Perform computations - basic

2.8C10 Perform computations

Element 2.13C5.1 Performs calculations involving the six trigonometrical ratios

Criteria 2.13C5.1.1

Calculations are performed to solve problems involving right angled triangles, using appropriate ratios.

Assessor guide: observe that –

The appropriate trigonometrical ratios are used to solve given problems involving right-angled triangles.

Assessor guide: confirm that –

The six trigonometrical ratios can be correctly identified. The trigonometrical ratios for given angles can be determined. The angles corresponding to given trigonometrical ratios can be determined.

Element 2.13C5.2 Applies the sine and cosine rule in the solution of problems

Criteria 2.13C5.2.1

Calculations are performed on non right-angled triangles utilising the sine and cosine rule.

Assessor guide: observe that –

The cosine rule and sine rule are used to solve given problems involving non right-angled triangles.

Assessor guide: confirm that –

The sine rule and cosine rule can be correctly identified.

Element 2.13C5.3 Performs simple algebraic operations

Criteria 2.13C5.3.1

Simple transposition of formulae is carried out to isolate the variable required, involving, addition, subtraction, multiplication, division.

Assessor guide: observe that –

Given formulae are transposed to isolate the required term. The four mathematical operations are correctly used in the transposition of formulae.

Assessor guide: confirm that –

The appropriate mathematical operation(s) to isolate the required term can be identified.

Criteria 2.13C5.3.2

Formulae is constructed to solve problems involving simple shapes or concepts.

Assessor guide: observe that –

Where appropriate, formulae are constructed to enable problems to be solved.

Assessor guide: confirm that –

The procedures for constructing formulae involving simple shapes or concepts can be identified.

Criteria 2.13C5.3.3

Simple equations are solved involving one unknown value.

Assessor guide: observe that –

Equations involving one unknown term are solved correctly.

Assessor guide: confirm that –

The reasons for checking the accuracy of the calculated answer can be given.

Element 2.13C5.4 Uses geometrical principles in the solution of problems**Criteria 2.13C5.4.1**

The solution to problems is facilitated by applying geometrical properties of angles, triangles and circles in the calculations.

Assessor guide: observe that –

The appropriate geometrical principles are used to solve problems involving angles, triangles and circles.

Assessor guide: confirm that –

The geometric properties of triangles can be identified. The geometric properties of circles can be given. The geometric properties of parallel lines intersected by an inclined line can be given.

Element 2.13C5.5 Calculates areas and volumes of complex shapes**Criteria 2.13C5.5.1**

Applies given formulae for the calculation of areas and volumes.

Assessor guide: observe that –

Assessor guide: confirm that –

The appropriate formulae are selected to determine the areas and volumes of given shapes. The formulae for determining the areas of plane figures including circles, rectangles, triangles and trapeziums can be identified. The formulae for determining the volumes of right prisms can be identified. The formulae for determining the volumes of right pyramids and cones can be identified. The formulae for determining the volume of a sphere can be identified. The formulae for determining the volume of non-right pyramids, cones and prisms can be identified.

Criteria 2.13C5.5.2

Calculates areas and volumes of composite shapes which may include conical sections.

Assessor guide: observe that –

The appropriate formulae are selected to determine the areas and volumes of complex shapes.

Assessor guide: confirm that –

The standard shapes that composite figures are constructed from can be identified. The appropriate mathematical operation to be applied to composite shapes involving holes can be identified.

Range statement

A variety of devices may be used to assist with calculations. Mathematical techniques may be applied in a variety of engineering contexts.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or a combination of both on and off the job. The computations to be performed should be consistent with the individual's field of work and relate to procedures, tools, equipment, materials and documentation relevant to that field of work. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the computations being performed or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 2.14C5 A Use graphical techniques and perform simple statistical computations

Band – Core

Field – Core

Unit Weight 2

Notes - This unit can be regarded as a Specialisation band A unit from C11 onwards

Pre-requisite units - Path 1

2.7C10 Perform computations - basic

2.8C10 Perform computations

Element 2.14C5.1 Reads and constructs graphs from given or determined data

Criteria 2.14C5.1.1

Complex information is extracted from graphical representation.

Assessor guide: observe that –

The required information is obtained by interpreting data presented in graphical form.

Assessor guide: confirm that –

The characteristics of straight line, parabolic and hyperbolic curves can be identified. The procedures for determining the slope/rate of change of a curve can be given.

Criteria 2.14C5.1.2

Data is analysed with respect to emerging trends.

Assessor guide: observe that –

The trend(s) indicated by the data presented in graphical form are correctly determined.

Assessor guide: confirm that –

The trend(s) indicated by changes in gradient of a graph can be identified.

Criteria 2.14C5.1.3

Graphs are constructed as required from data and drawn with respect to scale and accepted method.

Assessor guide: observe that –

Graphs are constructed to scale in accordance with standard procedures. The axes are appropriately labelled. The scales selected are appropriate to the purpose for which the graph is intended. Each coordinate is clearly and accurately plotted. Where appropriate, the upper and lower limits of acceptable outcomes are clearly marked on the graph.

Assessor guide: confirm that –

The procedures for drawing the line of best fit for the coordinates plotted can be identified.

Criteria 2.14C5.1.4

Significant features of graphical representation are understood such as limit lines, gradients (straight line graphs), intercepts, maximum and minimum values.

Assessor guide: observe that –

Assessor guide: confirm that –

The standard form of equations relating to straight lines and parabolic curves can be identified. The gradient, intercepts, maximum and minimum values and limit lines for straight line and parabolic curves can be identified.

Criteria 2.14C5.1.5

Constructs a wide variety of graphs as required including histograms, control charts, straight line graphs and parabolic graphs.

Assessor guide: observe that –

Histograms are constructed in accordance with standard procedures. Control charts are constructed in accordance with standard procedures. Straight line and parabolic graphs can be constructed from given formulae.

Assessor guide: confirm that –

The function of control charts can be identified.

Element 2.14C5.2 Performs basic statistical calculations**Criteria 2.14C5.2.1**

Calculates mean, median and mode from given data.

Assessor guide: observe that –

For a given set of data the mean, median and mode can be correctly determined.

Assessor guide: confirm that –

The meaning of the terms mean, median and mode can be given.

Criteria 2.14C5.2.2

Calculates standard deviation and understands the significance of 1, 2 and 3 sigma limits.

Assessor guide: observe that –

For a given set of data the standard deviation can be correctly determined.

Assessor guide: confirm that –

The meaning of the term standard deviation can be given. The significance of 1, 2 and 3 sigma limits can be identified.

Range statement

Graphs and charts may be applied to information from various work contexts, quality processes, production and market trends and other engineering applications. A range of devices may be used to assist with calculations.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or a combination of both on and off the job. The graphs to be constructed and computations to be performed should be consistent with the individual's field of work and relate to procedures, tools, equipment, materials and documentation relevant to that field of work. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with graphs being constructed and the computations being performed or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 2.15C5 A Operate in an autonomous team environment

Band – Core

Field – Core

Unit Weight 2

Notes - This unit can be regarded as a Specialisation band A unit from C12 onwards

Pre-requisite units - Path 1

2.3C11 Operate in a work based team environment

Element 2.15C5.1 Determine work roles of team members

Criteria 2.15C5.1.1

Team role and scope determined and understood using standard operating procedure.

Assessor guide: observe that –

Assessor guide: confirm that –

The role of the team can be identified. The scope of work for which the team is responsible can be identified.

Criteria 2.15C5.1.2

Role of self and team members understood and where appropriate clarified by all team participants.

Assessor guide: observe that –

Assessor guide: confirm that –

The individual's role within the team can be identified. The roles of the other team members can be identified. The procedures for clarifying the roles of team members can be identified.

Element 2.15C5.2 Participate in team planning

Criteria 2.15C5.2.1

Appropriate methods used to plan team activity or a number of related team activities.

Assessor guide: observe that –

Where appropriate, team planning meetings are scheduled in accordance with work site procedures.

Assessor guide: confirm that –

Appropriate methods of planning team activities can be identified. The activity(ies) to be planned can be identified.

Criteria 2.15C5.2.2

Planning activity is undertaken on an individual or shared basis, incorporating individual's technical skills, knowledge and competence.

Assessor guide: observe that –

Assessor guide: confirm that –

Each team member's technical skills, knowledge and competence, relevant to the tasks being planned, are accurately identified. The person(s) responsible for undertaking the planning activity can be identified.

Criteria 2.15C5.2.3

Effective and appropriate contributions are made to the total planning process.

Assessor guide: observe that –

The individual makes an effective and appropriate contribution to the planning process. The agreed plan, including where appropriate sequential steps and the roles and responsibilities of team members, is documented where appropriate in accordance with work site procedures.

Assessor guide: confirm that –

The impact of planning decisions on other teams, personnel and/or resources has been considered. The procedures for obtaining the necessary resources to carry out the plan can be identified. Where appropriate, input from non team members affected by the planning process have been sought. The resources necessary to carry out the plan can be identified.

Element 2.15C5.3 Operate as team member**Criteria 2.15C5.3.1**

Effective and appropriate forms of communication are used to liaise with team members.

Assessor guide: observe that –

Appropriate forms of communication are used to liaise with team members in accordance with work site procedures.

Assessor guide: confirm that –

A variety of appropriate means of communicating with team members can be identified. The reasons for selecting the means of communication used can be given.

Criteria 2.15C5.3.2

Contributes to determination of time lines, quality standards and production requirements for the team.

Assessor guide: observe that –

The individual makes an appropriate contribution to the determination of the production requirements, quality standards and/or timelines for the team.

Assessor guide: confirm that –

The production requirements of a given task can be correctly identified. The quality standards appropriate to a given task can be correctly identified. The factors affecting the time to undertake a given task can be identified.

Criteria 2.15C5.3.3

Real or perceived issues resolved by effective and appropriate contributions from team member.

Assessor guide: observe that –

Where appropriate, the individual makes an effective and appropriate contribution to the resolution of issues affecting team performance.

Assessor guide: confirm that –

The types of interpersonal issues that could affect team performance can be identified. Appropriate strategies for resolving given issues can be given.

Criteria 2.15C5.3.4

Effective and appropriate contributions made by team member to achieve team objectives, based on member's own technical skills, knowledge and competence.

Assessor guide: observe that –

The individual appropriately applies skills and knowledge to achieve team objectives.

Assessor guide: confirm that –

The individual can identify the skills and knowledge to be applied to a given task(s). The team objectives can be identified.

Element 2.15C5.4 Monitor and review team performance**Criteria 2.15C5.4.1**

Participate effectively in the planning and development of team review process.

Assessor guide: observe that –

The individual makes an appropriate contribution to the planning and development of team review processes.

Assessor guide: confirm that –

The need to review team performance can be identified. Team targets/goals can be identified. Team performance indicators can be identified. The reasons for reviewing team performance can be given.

Criteria 2.15C5.4.2

Appropriate data is collected on an individual and team basis using standard operating procedure.

Assessor guide: observe that –

Team performance data is collected in accordance with standard operating procedure.

Assessor guide: confirm that –

The sources of data relevant to the team performance indicators can be identified.

Criteria 2.15C5.4.3

Data collected, analysed and used by team and individual team members to evaluate team performance and determine future strategies.

Assessor guide: observe that –

The individual makes an appropriate contribution to the determination of future strategies to improve team performance.

Assessor guide: confirm that –

The actual team performance against team performance targets can be determined. Where appropriate, the reasons for discrepancies between actual and target team performance can be identified. Where appropriate, source(s) of approval for changes to team performance parameters can be identified.

Element 2.15C5.5 Implement team performance improvements**Criteria 2.15C5.5.1**

Performance improvement processes appropriate to team activities implemented on a collective and individual basis using standard operating procedure.

Assessor guide: observe that –

Performance improvement processes are implemented in accordance with standard operating procedures.

Assessor guide: confirm that –

The processes aimed at improving team performance can be identified. Where appropriate, the changes to the individual's and team members' roles/responsibilities can be identified. Where appropriate, the changes to procedures can be identified. Where appropriate, the changed targets, goals and/or objectives can be identified.

Range statement

This unit applies the skills necessary for effective participation by an individual in an autonomous team environment. Team parameters, constraints and objectives are determined by sources external to the team. Where as a result of team discussions or planning, team parameters require adjustment, then appropriate authorisation and approvals are established using standard operating procedures. Individual team participants would be already competent with technical aspects of team activities.

Evidence guide

Assessment context

This unit should be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. The individual would already be competent with the technical aspects of team activities.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with working in an autonomous team environment or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 2.16C5 A Interpret quality specifications and manuals

Band – Core

Field – Core

Unit Weight 4

Element 2.16C5.1 Identify and access all documentation

Criteria 2.16C5.1.1

Documentation covering all of the tiers of quality within the enterprise identified and used.

Assessor guide: observe that –

Documentation is accessed and can be used. Evidence of indexing, references etc. being used.

Assessor guide: confirm that –

Knowledge of documentation location and/or retrieval can be described.

Element 2.16C5.2 Interpret documentation

Criteria 2.16C5.2.1

Quality specification for specific processes and systems related and interpreted.

Assessor guide: observe that –

Correct specifications for process and/or systems are used, including other related specifications.

Assessor guide: confirm that –

Correct process used to identify relevant specifications can be described. Specifications can be described "in other words".

Criteria 2.16C5.2.2

The enterprise quality improvement system related to the formal documentation understood and used according to standard operating procedures.

Assessor guide: observe that –

Components of system are correctly used where appropriate. Formal documentation completed according to procedural specifications and requirements.

Assessor guide: confirm that –

Sound understanding of quality improvement process is apparent.

Element 2.16C5.3 Explain documentation

Criteria 2.16C5.3.1

Documentation relating to quality control/assurance explained to appropriate personnel.

Assessor guide: observe that –

Appropriate communication strategy adopted, including confirmation of received information.

Assessor guide: confirm that –

Appropriate communication strategy can be identified for all workplace situations.

Criteria 2.16C5.3.2

Instructions based on documentation given to appropriate personnel.

Assessor guide: observe that –

Information is presented in ways appropriate for the audience.

Assessor guide: confirm that –

A range of instructional techniques can be used.

Element 2.16C5.4 Monitor quality processes/systems**Criteria 2.16C5.4.1**

Quality improvement system monitored and maintained.

Assessor guide: observe that –

Appropriate records are maintained and audited. Relevant forms and/or systems are available for reporting. Quality system is followed according to established procedures.

Assessor guide: confirm that –

Quality system is understood and that system can be described. Components of quality system such as forms etc. are used and understood in terms of purpose and function.

Range statement

This standard covers a wide range of processes/systems and enterprises. It covers the interpretation of all of the tiers of quality documentation from standards such as AS3900 - AS3904 through to manuals, procedures and work instructions. Interpretation of technical requirements for production should be accessed through other technical units eg: interpret technical drawing. Documentation is accessed and applied to the specific enterprise.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the supervision and maintenance of the application of quality procedures or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 3.1A A Manual production assembly

Band – Specialisation band A

Field – Assembly

Unit Weight 4

Element 3.1A.1 Read and understand job sheets

Criteria 3.1A.1.1

Job sheets and instructions understood and followed correctly.

Assessor guide: observe that –

Job sheets and/or instructions are obtained in accordance with workplace procedures.

Assessor guide: confirm that –

The tasks to be undertaken can be identified. The sequence in which the tasks are to be performed can be identified.

Element 3.1A.2 Select assembly equipment and components

Criteria 3.1A.2.1

Assembly equipment is selected and used in accordance with instructions or job sheets to standard operating procedures.

Assessor guide: observe that –

The assembly equipment is selected in accordance with instructions or job sheets. The assembly equipment is used in accordance with standard operating procedures.

Assessor guide: confirm that –

The equipment to be used in the assembly process can be identified.

Criteria 3.1A.2.2

Components/sub-assemblies are obtained and arranged for assembly.

Assessor guide: observe that –

The correct components/sub-assemblies are obtained. The components/sub-assemblies are set out ready for assembly in accordance with standard operating procedures.

Assessor guide: confirm that –

The components/sub-assemblies to be assembled can be identified. The sources of the component/sub-assemblies can be identified.

Criteria 3.1A.2.3

Equipment or tools are used in a safe manner.

Assessor guide: observe that –

The assembly equipment and/or tools are used safely in accordance with standard operating procedures.

Assessor guide: confirm that –

The safety precautions to be taken with assembly equipment and/or tools can be identified.

Element 3.1A.3 Assembles components

Criteria 3.1A.3.1

Assembly produced following correct sequence of operations using selected equipment as appropriate to standard operating procedures.

Assessor guide: observe that –

The correct sequence of operations is followed during the assembly process. The selected assembly equipment is used in accordance with standard operating procedures.

Assessor guide: confirm that –

Criteria 3.1A.3.2

Records/inputs production data using standard operating procedure.

Assessor guide: observe that –

The production data is recorded in accordance with standard operating procedures.

Assessor guide: confirm that –

The production data to be recorded can be identified.

Element 3.1A.4 Performs tests**Criteria 3.1A.4.1**

Assembly tested/checked for compliance with job sheet requirements using standard operating procedures as required.

Assessor guide: observe that –

The assembly is tested/checked for compliance with job sheet requirements in accordance with standard operating procedures.

Assessor guide: confirm that –

The tests/checks to be applied to the assembly can be identified. The action to be taken if an assembly does not comply with the job sheet requirement can be identified.

Element 3.1A.5 Protects assembly from damage**Criteria 3.1A.5.1**

Components and/or assembly are handled and stored in a safe manner least likely to cause damage using standard operating procedure.

Assessor guide: observe that –

The components and/or assembly are handled and stored in a safe manner in accordance with standard operating procedures.

Assessor guide: confirm that –

The safe handling and storage procedures applicable to components and/or assemblies can be identified. The damage that can be done to components and/or assemblies through the use of inappropriate handling and storage procedures can be identified.

Range statement

Assembly process can be carried out autonomously or in a team environment. This unit applies to assembly operations that are essentially manual in nature and which do not require complex adjustments. This unit should not be selected when Unit 18.55A (Dismantle, replace and assemble engineering components) has already been selected. Where the selection and use of tools is required as part of the assembly process see Unit 18.1A (Use hand tools) and Unit 18.2A (Use power tools/hand held operations) as appropriate.

Evidence guide

Assessment context

This unit should be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the assembly process or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 3.2A A Precision assembly

Band – Specialisation band A

Field – Assembly

Unit Weight 4

Pre-requisite units - Path 1

18.1A Use hand tools

Element 3.2A.1 Read and understand job sheets

Criteria 3.2A.1.1

Job sheet or equivalent instructions interpreted correctly.

Assessor guide: observe that –

Job sheets and/or instructions are obtained in accordance with workplace procedures.

Assessor guide: confirm that –

The tasks to be undertaken can be identified.

Criteria 3.2A.1.2

All components/parts checked against job sheet, assembly list or equivalent instructions.

Assessor guide: observe that –

All component parts are checked against the job sheet, assembly list or instructions.

Assessor guide: confirm that –

The component parts can be identified.

Criteria 3.2A.1.3

Fitting requirements and sequential assembly planning carried out where applicable.

Assessor guide: observe that –

Where appropriate, a sequential assembly plan is prepared.

Assessor guide: confirm that –

Where appropriate, the fitting requirements can be identified.

Element 3.2A.2 Select and use assembly tools and equipment

Criteria 3.2A.2.1

Tools, equipment and components/parts selected to meet job requirements.

Assessor guide: observe that –

Tools and equipment are selected in accordance with job requirements. The components/parts are selected in accordance with job requirements.

Assessor guide: confirm that –

The tools and equipment required to carry out the assembly can be identified.

Element 3.2A.3 Assemble engineering components**Criteria 3.2A.3.1**

Defective or faulty parts identified and processed according to standard operating procedure.

Assessor guide: observe that –

Defective or faulty parts are identified and processed according to standard operating procedures.

Assessor guide: confirm that –

Common part faults or defects can be identified. The procedures for dealing with faulty or defective parts can be given.

Criteria 3.2A.3.2

Parts/components correctly prepared for assembly.

Assessor guide: observe that –

Where appropriate parts/components are correctly prepared for assembly.

Assessor guide: confirm that –

Where appropriate the preparation requirements of parts prior to assembly can be identified.

Criteria 3.2A.3.3

Appropriate technique and principles applied in assembly activity.

Assessor guide: observe that –

The components are assembled using appropriate techniques and principles in accordance with standard operating procedures.

Assessor guide: confirm that –

The assembly requirements of components/parts can be identified.

Criteria 3.2A.3.4

Appropriate records/data maintained or processed.

Assessor guide: observe that –

The appropriate records are kept/ maintained in accordance with standard operating procedures.

Assessor guide: confirm that –

The records to be kept/maintained can be identified.

Criteria 3.2A.3.5

Component parts of assembly fitted to ensure correct positioning and conformance with specifications.

Assessor guide: observe that –

The component parts are fitted to ensure correct positioning and conformance to specifications.

Assessor guide: confirm that –

Where appropriate the positioning requirements of components can be identified. Where appropriate the fitting specifications of the components can be identified.

Criteria 3.2A.3.6

Assembly tested to ensure that components interface/interact according to operational specifications.

Assessor guide: observe that –

The assembly is tested for conformance to operational specifications in accordance with standard operating procedures.

Assessor guide: confirm that –

The operational specifications of the assembly can be identified.

Element 3.2A.4 Adjust mechanical assemblies**Criteria 3.2A.4.1**

Final adjustments performed on assembly to ensure alignment with operational specifications.

Assessor guide: observe that –

Where appropriate, the assembly is adjusted to ensure conformance with operational specifications, in accordance with standard operating procedures.

Assessor guide: confirm that –

The adjustments that can be made to the assembly can be identified. The effects of adjustments to the assembly on the operation of the assembly can be identified.

Criteria 3.2A.4.2

Faulty assemblies identified for rework by operator or where fault is outside scope of work station, processed according to standard operating procedure.

Assessor guide: observe that –

Where appropriate, faulty assemblies are identified in accordance with standard operating procedures.

Assessor guide: confirm that –

The faults that can be rectified by the operator can be identified. The faults that cannot be rectified by the operator can be identified. The procedures for dealing with faults outside the scope of the operator's work station can be given.

Criteria 3.2A.4.3

Assembly correctly marked/tagged/identified where appropriate.

Assessor guide: observe that –

Where appropriate, the assembly is correctly marked/tagged/identified as faulty in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for marking/tagging/ identifying faulty assemblies can be given.

Element 3.2A.5 Protects assembly from damage**Criteria 3.2A.5.1**

Components and/or assembly are handled and stored in a manner least likely to cause damage using standard operating procedure.

Assessor guide: observe that –

The components and/or assembly are handled and stored in a safe manner in accordance with standard operating procedures.

Assessor guide: confirm that –

The safe handling and storage procedures applicable to components and/or assemblies can be identified. The damage that can be done to components and/or assemblies through the use of inappropriate handling and storage procedures can be identified.

Range statement

Assembly process can be carried out autonomously or in a team environment. This unit applies to assembly operations that are essentially manual in nature and require the application of accepted engineering principles and practices. Assembly activities typically involve build-to-order work and/or low volume and/or complex assemblies and/or long assembly time frames. Work may involve manual adjustments to correct eg: clearances, mesh, tension, level, alignment, etc. using predetermined standards of quality and safety. Applications of this unit may also require varying levels of measurement competencies, where this is the case refer to Units 2.5C11 (Measure with graduated devices) or 12.3A (Precision mechanical measurement). This unit should not be selected when Unit 18.55A (Dismantle, replace and assemble engineering components) is/has been also selected.

Evidence guide

Assessment context

This unit should be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with precision assembly or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 3.3A A Sheet and plate assembly

Band – Specialisation band A

Field – Assembly

Unit Weight 4

Pre-requisite units - Path 1

18.1A Use hand tools

18.2A Use power tools/hand held operations

Element 3.3A.1 Read and understand job sheets

Criteria 3.3A.1.1

Job sheets/instruction correctly interpreted and followed.

Assessor guide: observe that –

Job sheets and/or instructions are obtained in accordance with work place procedures.

Assessor guide: confirm that –

The tasks to be undertaken can be identified. The sequence in which the tasks are to be performed can be identified.

Element 3.3A.2 Select and use sheet and plate assembly equipment

Criteria 3.3A.2.1

Assembly equipment is selected in accordance with instructions on job sheet.

Assessor guide: observe that –

The assembly equipment is selected in accordance with instructions or job sheets. The assembly equipment is used in accordance with standard operating procedures.

Assessor guide: confirm that –

The equipment to be used in the assembly process can be identified.

Criteria 3.3A.2.2

Equipment is used in a safe manner according to standard operating procedure.

Assessor guide: observe that –

The assembly equipment and/or tools are used safely in accordance with standard operating procedures.

Assessor guide: confirm that –

The safety precautions to be taken with the assembly equipment and/or tools can be identified.

Element 3.3A.3 Assembles fabrications

Criteria 3.3A.3.1

Assembly produced following correct sequence of operations.

Assessor guide: observe that –

The correct sequence of operations is followed during the assembly process. The selected assembly/joining equipment is used in accordance with standard operating procedures.

Assessor guide: confirm that –

Criteria 3.3A.3.2

Assemblies/fabrications joined according to specification using appropriate techniques.

Assessor guide: observe that –

The components/fabrications are joined using appropriate techniques in accordance with standard operating procedures.

Assessor guide: confirm that –

The joining technique to be used can be identified. The procedures to be followed when joining sheet, plate and/or fabrications can be given.

Criteria 3.3A.3.3

Assembly tested/checked for compliance with job sheet requirements using standard operating procedures.

Assessor guide: observe that –

The assembly is tested/checked for compliance with job sheet requirements in accordance with standard operating procedures.

Assessor guide: confirm that –

The tests/checks to be applied to the assembly can be identified. The action to be taken if an assembly does not comply with the job sheet requirement can be identified.

Element 3.3A.4 Protects assembly from damage**Criteria 3.3A.4.1**

Assemblies/fabrications are handled and stored in a safe manner least likely to cause damage using standard operating procedures.

Assessor guide: observe that –

The components, fabrications and/or assembly are handled and stored in a safe manner in accordance with standard operating procedures.

Assessor guide: confirm that –

The safe handling and storage procedures applicable to components, fabrications and/or assemblies can be identified. The damage that can be done to components, fabrications and/or assemblies through the use of inappropriate handling and storage procedures can be identified.

Range statement

This unit covers production assembly of pre-fabricated/formed components. Applications of this unit may include manufacture of white goods, appliances, electrical cabinets, etc; metal furniture, cladding and shelving, box trailer bodies, ductwork and other sheet and plate assemblies. Joining processes may include seaming, bonding, riveting, etc. Assembly equipment covers jigs, fixtures and other appropriate tools. Assembly process can be carried out autonomously or in a team environment using predetermined standards of quality and safety. Where production welding skills are required refer to Unit 5.13A (Perform manual production welding). Where measurement skills are required refer to Unit 2.5C11 (Measure with graduated devices) or Unit 12.3A (Precision mechanical measurement).

Evidence guide

Assessment context

This unit should be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the assembly of sheet and plate or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 3.4A A Electronic/electrical assembly (production)

Band – Specialisation band A

Field – Assembly

Unit Weight 8

Element 3.4A.1 Read and understand job sheets

Criteria 3.4A.1.1

Job sheets and instructions understood and followed correctly.

Assessor guide: observe that –

Job sheets and instructions are obtained in accordance with work site procedures. The job sheet and instructions are followed correctly throughout the assembly process.

Assessor guide: confirm that –

The job requirements can be identified.

Element 3.4A.2 Select assembly equipment

Criteria 3.4A.2.1

Assembly equipment is selected and used in accordance with instructions or job sheets to standard operating procedures.

Assessor guide: observe that –

Appropriate tools and equipment are selected in carrying out assembly tasks to standard operating procedures.

Assessor guide: confirm that –

Items of assembly equipment and their application can be identified.

Criteria 3.4A.2.2

Equipment is used in a safe manner.

Assessor guide: observe that –

All tools and equipment are used in a safe manner.

Assessor guide: confirm that –

The hazards associated with the misuse of tools and equipment can be identified.

Element 3.4A.3 Identify electronic/electrical components

Criteria 3.4A.3.1

Identify by name, appearance, colour, common electronic and electrical components.

Assessor guide: observe that –

Specified electronic and electrical components can be correctly selected from a range of components.

Assessor guide: confirm that –

Common electronic and electrical components can be identified by name, colour and appearance.

Criteria 3.4A.3.2

Identify polarity indicators on components.

Assessor guide: observe that –

Assessor guide: confirm that –

The polarity indicators on common electronic and electrical components can be identified. The consequences of connecting electronic and electrical components with incorrect polarity can be given.

Element 3.4A.4 Assemble components**Criteria 3.4A.4.1**

Selects correct components by code/colour or other identification methods.

Assessor guide: observe that –

The correct components are selected for assembly in accordance with instructions and work site procedures.

Assessor guide: confirm that –

The components to be assembled can be identified from the job instructions.

Criteria 3.4A.4.2

Prepares components/devices for soldering or other termination methods.

Assessor guide: observe that –

The components/devices are correctly prepared for soldering and termination in accordance with instructions and work site procedures.

Assessor guide: confirm that –

A range of termination methods can be identified. The preparation requirements for components/devices to be soldered can be identified. The preparation requirements for components/devices that are to be terminated using non-soldering techniques can be identified.

Criteria 3.4A.4.3

Connect cables to a variety of plug and socket combinations as required.

Assessor guide: observe that –

Cables are connected to plugs/sockets in accordance with instructions and work site procedures.

Assessor guide: confirm that –

The connection requirements of a variety of plugs and sockets can be identified.

Criteria 3.4A.4.4

Components are safely handled and stored using appropriate anti-static handling procedures and techniques in accordance with standard operating procedure.

Assessor guide: observe that –

All components are safely handled and stored in accordance with work site procedures. Where appropriate anti-static handling procedures and techniques are used in accordance with work site procedures.

Assessor guide: confirm that –

Anti-static procedures and techniques can be identified. The safe handling and storage requirements of electrical and electronic components can be identified.

Criteria 3.4A.4.5

Produces assembly following correct sequence of operations.

Assessor guide: observe that –

Correct sequence of operation is followed.

Assessor guide: confirm that –

The consequences of not following the correct sequence of operations can be given.

Element 3.4A.5 Performs tests**Criteria 3.4A.5.1**

Assembly tested/checked for compliance with job sheet requirements using standard operating procedures.

Assessor guide: observe that –

All work is checked for conformance to specification in accordance with work site procedures and instructions.

Assessor guide: confirm that –

The specifications against which the assembly is to be checked/tested can be identified. The appropriate test/check procedures can be identified.

Criteria 3.4A.5.2

Records and inputs production data as required.

Assessor guide: observe that –

All production records and reports are completed in accordance with work site procedures.

Assessor guide: confirm that –

The data to be recorded and the frequency of recording can be identified.

Range statement

Given a range of workstations, is able to assemble components and be responsible for own quality. Assembly can be carried out autonomously or in a team environment across a range of industries. This unit is applied to assembly of electronic/electrical components or equipment to pre-determined specification and following pre-determined procedures including automatic wave soldering machines. Soldering skills, if required, are covered by Unit 5.1A (Manual soldering/desoldering - electrical/electronic components) or Unit 5.2A (High reliability soldering and desoldering). If measurement skills are required then Unit 12.2A (Electrical/electronic measurement) should also be selected. Where the selection and use of tools is required as part of the assembly process, see Units 18.1A (Use hand tools) and 18.2A (Use power tools/hand held operations) as appropriate.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the rework and repair of electrical and electronic products/components, or other competencies requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documents required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training relating to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment, the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities.

Unit MEM 3.5A A Rework and repair (electrical/electronic production)

Band – Specialisation band A

Field – Assembly

Unit Weight 8

Pre-requisite units - Path 1

3.4A Electronic/electrical assembly (production)

5.1A Manual soldering/desoldering - electrical/electronic components

18.1A Use hand tools

Element 3.5A.1 Performs tests

Criteria 3.5A.1.1

Assembly tested for functional requirements from job sheet.

Assessor guide: observe that –

The appropriate job sheet is obtained in accordance with work site procedures. Appropriate tests are conducted on the assembly in accordance with work site procedures.

Assessor guide: confirm that –

The functional requirements of the assembly can be identified. The tests to be performed on the assembly can be identified.

Criteria 3.5A.1.2

Identifies faults in assembly or soldering.

Assessor guide: observe that –

The assembly or soldering fault(s) is identified in accordance with work site procedures.

Assessor guide: confirm that –

Examples of faults in connections and components and their symptoms can be given.

Element 3.5A.2 Diagnoses cause of fault problems and rectifies fault

Criteria 3.5A.2.1

Cause of fault identified using standard operating procedure.

Assessor guide: observe that –

The cause of the fault is identified in accordance with work site procedures.

Assessor guide: confirm that –

Causes of faults in connections and components can be given.

Criteria 3.5A.2.2

Repair and/or rework completed and instructions from job cards, drawings, assembly specification.

Assessor guide: observe that –

All information relevant to the repair and/or rework to be undertaken is obtained in accordance with work site procedures. The repair and/or rework is completed to specification in accordance with instructions and work site procedures.

Assessor guide: confirm that –

The repair or rework to be undertaken to return the assembly to specification can be identified.

Criteria 3.5A.2.3

Components are safely handled and stored using appropriate anti-static handling procedures and techniques.

Assessor guide: observe that –

All components are safely handled and stored in accordance with work site procedures. Where appropriate, anti-static handling procedures and techniques are used in accordance with work site procedures.

Assessor guide: confirm that –

The dangers of static electricity to electrical and electronic components can be identified. Anti-static procedures and techniques can be identified. The safe handling and storage requirements of electrical and electronic components can be identified.

Range statement

Given a range of components and printed circuit boards, the worker is able to carry out diagnosis of faults in accordance with established procedures, rework and repair and be responsible for own quality. Work may be carried out in a team or autonomously. Applications of this unit may also require varying levels of measurement competencies.

Evidence guide**Assessment context**

This unit should be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documents required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training relating to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the rework and repair of electrical and electronic products/components, or other competencies requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Special notes

During assessment, the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities.

Unit MEM 3.6A A Setting assembly stations

Band – Specialisation band A

Field – Assembly

Unit Weight 2

Notes - Note: Unit 3.3A (Sheet & plate assembly) if selected also has a prerequisite Unit 18.2A (Use power tools/hand held operations).

Pre-requisite units - Path 1

3.1A Manual production assembly

18.1A Use hand tools

Pre-requisite units - Path 2

3.3A Sheet and plate assembly

18.1A Use hand tools

18.2A Use power tools/hand held operations

Pre-requisite units - Path 3

3.4A Electronic/electrical assembly (production)

18.1A Use hand tools

Element 3.6A.1 Identify job requirements

Criteria 3.6A.1.1

Job sheets/instructions interpreted and understood.

Assessor guide: observe that –

Job sheets and/or instructions obtained in accordance with workplace procedures.

Assessor guide: confirm that –

The tasks to be undertaken can be identified.

Element 3.6A.2 Select and use a range of hand tools and equipment

Criteria 3.6A.2.1

Hand tools and equipment are used in a safe manner in accordance with instructions and legislative requirements.

Assessor guide: observe that –

Hand tools and equipment are used safely in accordance with instructions, legislative requirements and standard operating procedures.

Assessor guide: confirm that –

The safety precautions to be taken with hand tools and equipment can be identified.

Element 3.6A.3 Sets assembly station

Criteria 3.6A.3.1

Assembly station is set up in accordance with defined procedures.

Assessor guide: observe that –

The assembly station is set up in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures to be followed in setting up assembly stations can be identified.

Criteria 3.6A.3.2

Safe working practices are observed and implemented.

Assessor guide: observe that –

Safe working practices are followed throughout the setting up process.

Assessor guide: confirm that –

Any safety hazards associated with the assembly station and/or its setting up can be identified.

Criteria 3.6A.3.3

Assembly station is adjusted to meet specifications and operational requirements.

Assessor guide: observe that –

Where appropriate, the assembly station is adjusted to meet specifications and operational requirements in accordance with standard operating procedures.

Assessor guide: confirm that –

The specifications applicable to the assembly station can be identified. The operational requirements of the assembly station can be identified. The effect of various adjustments that can be made to the assembly station, on the specifications and operational requirements of the assembly station can be given.

Criteria 3.6A.3.4

Assembly station is tested for correct operation.

Assessor guide: observe that –

The appropriate tests are carried out on the assembly station to ensure its correct operation in accordance with standard operating procedures.

Assessor guide: confirm that –

The tests applicable to the operation of the assembly station can be identified.

Element 3.6A.4 Maintains equipment**Criteria 3.6A.4.1**

Carries out routine maintenance according to standard operating procedures.

Assessor guide: observe that –

Routine maintenance is carried out in accordance with standard operating procedures.

Assessor guide: confirm that –

The routine maintenance tasks to be carried out can be identified. The frequency at which the routine maintenance tasks are to be carried out can be identified.

Criteria 3.6A.4.2

Worn or damaged components identified and changed.

Assessor guide: observe that –

Worn or damaged components are changed in accordance with standard operating procedures.

Assessor guide: confirm that –

Worn or damaged components can be correctly identified. The effect of worn or damaged components on the operational requirements and specifications of the assembly station can be given.

Range statement

This unit covers the setting up of a range of jobbing assembly stations and may include ensuring that appropriate jigs, fixtures, die sets, stores and tooling etc. are in place as required to meet the production order or schedules. Assembly stations may be used for operations such as riveting, pressing, screwing, tensioning etc. and processes such as testing, gluing, identification, numbering or simple hot stamping etc. of components/assemblies. For setting of automated assembly processes Unit 3.7A (Setting multistage continuous process lines) should be selected as appropriate. Machine setting skills are covered by Unit 7.3A (Setting machines (routine)) and Unit 7.4A (Setting machines (complex)). Where measurement skills are required then Unit 2.5C11 (Measure with graduated devices) should also be considered.

Evidence guide

Assessment context

This unit should be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the setting of assembly stations or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 3.7A A Setting multistage continuous process lines

Band – Specialisation band A

Field – Assembly

Unit Weight 6

Pre-requisite units - Path 1

7.24A Operate and monitor machine/process

18.1A Use hand tools

Element 3.7A.1 Determine process

Criteria 3.7A.1.1

Job sheets/instructions interpreted and understood.

Assessor guide: observe that –

Job sheets/instructions are obtained in accordance with work site procedures.

Assessor guide: confirm that –

The tasks to be undertaken can be identified.

Element 3.7A.2 Select and use a range of hand tools and equipment

Criteria 3.7A.2.1

Hand tools and equipment are used in a safe manner in accordance with standard operating procedures.

Assessor guide: observe that –

Hand tools and equipment are safely used in accordance with standard operating procedures.

Assessor guide: confirm that –

The safety precautions to be taken when using hand tools and equipment associated with the process line to be set can be identified.

Element 3.7A.3 Set process line

Criteria 3.7A.3.1

Process line is set up to specifications in accordance with standard operating procedure.

Assessor guide: observe that –

The process line is set to specification in accordance with standard operating procedures.

Assessor guide: confirm that –

The specifications applying to the process line can be identified.

Criteria 3.7A.3.2

All sensors, process links, displays, monitors, feedback loops etc. are set up to specifications using standard operating procedures.

Assessor guide: observe that –

All sensors, process links, displays, monitors, feedback loops etc. are set to specifications in accordance with standard operating procedures.

Assessor guide: confirm that –

All sensors, process links, displays, monitors, feedback loops etc. incorporated in the process line can be identified. The specifications applicable to the sensors, process links, displays, monitors, feedback loops etc. incorporated in the process line can be identified.

Criteria 3.7A.3.3

All safety apparatus is in place and checked for correct operation.

Assessor guide: observe that –

All safety apparatus is in place and checked for correct operation.

Assessor guide: confirm that –

The function of all safety apparatus incorporated in the process line can be given. The correct operation and specification for all safety apparatus incorporated in the process line can be identified.

Criteria 3.7A.3.4

Process line is run to meet predetermined production and quality requirements.

Assessor guide: observe that –

The process line is operated in accordance with standard operating procedures. The product is checked for conformance to quality requirements and specifications. The process line operation is checked for conformance to production requirements.

Assessor guide: confirm that –

The product specifications and quality requirements can be identified. The production requirements can be identified

Criteria 3.7A.3.5

Process line is adjusted to meet specifications and operational requirements.

Assessor guide: observe that –

Where appropriate, the process line is adjusted to meet specifications and operational requirements in accordance with standard operating procedures.

Assessor guide: confirm that –

The effect of process line adjustments on product and operational specifications can be given.

Criteria 3.7A.3.6

Operator(s) instructed as required.

Assessor guide: observe that –

Where appropriate, operators are instructed on the operational requirements of the process line.

Assessor guide: confirm that –

The requirements of operators in the operation and monitoring of the continuous process line can be identified.

Range statement

This unit applies to the setting of a wide range of continuous process lines where operations are performed by machines and equipment that are sequentially linked. This may include mechanical assembly operations, electrical/electronic assembly operations and processes such as welding, testing, insertion, filling, printing, hot stamping etc. Work may be carried out autonomously or as part of a work team. All work is carried out to predetermined standards of quality, safety and specifications. Where setting or adjustment of NC/CNC or PLC controls is required, then appropriate units should be selected.

Evidence guide

Assessment context

This unit should be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the setting of multistage continuous process lines or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 4.1A A Operate melting furnaces

Band – Specialisation band A

Field – Casting & moulding

Unit Weight 4

Pre-requisite units - Path 1

13.4A Work safely with molten metals/glass

Element 4.1A.1 Materials selected

Criteria 4.1A.1.1

Requisitions completed as required according to standard operating procedures.

Assessor guide: observe that –

The quantities of materials required are ordered in accordance with work site procedures.

Assessor guide: confirm that –

The appropriate materials ordering/requisitioning procedures can be identified. The person(s) responsible for authorising/approving materials orders/requisitions can be identified.

Criteria 4.1A.1.2

Charge analysis is undertaken in accordance with standard operating procedures.

Assessor guide: observe that –

The charge analysis is achieved in accordance with work site procedures.

Assessor guide: confirm that –

The appropriate sources of information on charge analysis can be identified. The material to be loaded into the furnace can be identified. The percentage composition of each component material required to achieve the metal specification can be identified.

Criteria 4.1A.1.3

The charge analysis is converted to furnace charge weight using standard operating procedures.

Assessor guide: observe that –

The quantities of materials required to achieve the specified charge weight are correctly determined in accordance with work site procedures.

Assessor guide: confirm that –

The sources of information relating to materials and composition to produce specified metals can be identified.

Criteria 4.1A.1.4

Charge is weighed according to standard operating procedures.

Assessor guide: observe that –

Weight of charge is correctly determined in accordance with work site procedures.

Assessor guide: confirm that –

The sources of information for determining correct charge weight can be identified.

Element 4.1A.2 Start up furnace**Criteria 4.1A.2.1**

Inspect furnace for any defects or damage.

Assessor guide: observe that –

Furnace inspected for any defects or damage in accordance with work site procedures.

Assessor guide: confirm that –

The sources of information relating to identifying defects or damage to furnace can be identified.

Criteria 4.1A.2.2

Routine operational maintenance of furnace undertaken to standard operating procedures.

Assessor guide: observe that –

Routine operational maintenance of the furnace is undertaken in accordance with work site procedures.

Assessor guide: confirm that –

The routine maintenance to be carried out on the furnace can be identified.

Criteria 4.1A.2.3

Start up furnace according to standard operating procedures.

Assessor guide: observe that –

Start up of the furnace is undertaken in accordance with work site procedures.

Assessor guide: confirm that –

The sources of information for the starting up of the furnace can be identified.

Criteria 4.1A.2.4

Report faults using standard operating procedures.

Assessor guide: observe that –

Faults identified during start up of the furnace reported in accordance with work site procedures.

Assessor guide: confirm that –

The sources of information for the reporting of faults can be identified.

Element 4.1A.3 Charge furnace**Criteria 4.1A.3.1**

Emergency/safety procedures identified and followed as necessary.

Assessor guide: observe that –

Appropriate safety clothing and apparatus is used at all times.

Assessor guide: confirm that –

Safety clothing and apparatus and their applications can be identified. The hazards associated with feeding materials into a furnace can be identified. The precautions to be taken to avoid/overcome hazards associated with feeding of materials into a furnace can be given.

Criteria 4.1A.3.2

Materials are preheated if required according to standard operating procedures.

Assessor guide: observe that –

The materials are preheated in accordance with work site procedures.

Assessor guide: confirm that –

The sources of information for preheating materials can be identified.

Criteria 4.1A.3.3

Materials are charged into furnace using standard operating procedures.

Assessor guide: observe that –

The materials are fed into the furnace safely and at the appropriate rate in accordance with work site procedures.

Assessor guide: confirm that –

The appropriate feed rate for materials to produce a required metal can be identified. The source of information on feed rates for production of specific metals can be identified.

Criteria 4.1A.3.4

Suitable areas for emergency unloading of molten metal are identified and kept available.

Assessor guide: observe that –

Suitable areas for emergency unloading of molten metal are kept available.

Assessor guide: confirm that –

The appropriate areas for emergency unloading of molten metal can be identified.

Element 4.1A.4 Monitor furnace**Criteria 4.1A.4.1**

Furnace is maintained at optimum operating condition to standard operating procedure.

Assessor guide: observe that –

The furnace is maintained at the optimum operating temperatures throughout the process in accordance with work site procedures.

Assessor guide: confirm that –

The optimum operating temperature of the furnace to produce a specified metal can be identified. The source of information on optimum furnace operating temperatures can be identified.

Criteria 4.1A.4.2

Chemical analysis is taken and remedial action applied as required to standard operating procedure.

Assessor guide: observe that –

The chemical analysis is taken and remedial action applied as required in accordance with work site procedures.

Assessor guide: confirm that –

The sources of information on chemical analysis can be identified. The material to be input to the furnace can be identified. The percentage of each material required to achieve the metal specification can be identified.

Criteria 4.1A.4.3

Furnace is drossed and/or degassed to standard operating procedure.

Assessor guide: observe that –

The furnace is drossed/degassed in accordance with work site procedures.

Assessor guide: confirm that –

The stage and frequency at which the furnace is to be drossed/degassed can be identified. The function of the dross in the production of metals can be given.

Element 4.1A.5 Tap or unload the furnace**Criteria 4.1A.5.1**

Quantity of the required metal is identified.

Assessor guide: observe that –

Assessor guide: confirm that –

The sources of information relating to the correct quantity of the required metal can be identified.

Criteria 4.1A.5.2

Tap rate is carried out to standard operating procedure.

Assessor guide: observe that –

The metal is tapped from the furnace safely and at the appropriate rate in accordance with work site procedures.

Assessor guide: confirm that –

The appropriate tap rate for the required metal can be identified. The source of information on tap rates for specific metals can be identified.

Criteria 4.1A.5.3

Tapping or unloading undertaken and completed safely according to standard operating procedure.

Assessor guide: observe that –

The furnace is tapped or unloaded safely in accordance with work site procedures.

Assessor guide: confirm that –

The source of information for tapping or unloading the furnace can be identified.

Element 4.1A.6 Shutdown furnace**Criteria 4.1A.6.1**

Shut-down of furnace completed to standard operating procedure.

Assessor guide: observe that –

The furnace is shut-down safely in accordance with work site procedures.

Assessor guide: confirm that –

The source of information for shutting down the furnace can be identified.

Criteria 4.1A.6.2

Routine operational maintenance of furnace undertaken to standard operating procedure.

Assessor guide: observe that –

Routine operational maintenance of the furnace is undertaken in accordance with work site procedures.

Assessor guide: confirm that –

The routine maintenance to be carried out on the furnace can be identified. The frequency with which routine maintenance is to be carried out can be given.

Range statement

This unit covers singular or multi, coke, oil, gas fired or electric furnaces and a range of metals. All work is carried out to predetermined specifications and standards of quality, safety, regulatory and legislative requirement. Work may be undertaken as part of a workteam. Operational maintenance may extend to routine lubrication, cleaning, routine repair/repointing of refractory. Furnaces would primarily be used for continuous or staged bulk melting/smelting of metals, holding of hot liquids, or the melting of metals for production processes eg. drawing, casting/moulding, galvanising, extrusion etc. This unit would not normally be selected in a toolmaking or other one-off environment. Simple heat treatment processes like annealing, heating or quenching processes undertaken as incidental to trade work (eg. toolmaking) are covered by Unit 6.7A (Perform basic incidental heat/quenching, tempering and annealing).

Evidence guide

Assessment context

This unit should be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the operation of furnaces or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 4.2A A Gravity die casting

Band – Specialisation band A

Field – Casting & moulding

Unit Weight 2

Pre-requisite units - Path 1

13.4A Work safely with molten metals/glass

Element 4.2A.1 Prepare equipment

Criteria 4.2A.1.1

Die coat mixed in correct proportion.

Assessor guide: observe that –

The die coat is mixed in the correct proportions in accordance with standard operating procedures.

Assessor guide: confirm that –

The purpose of the die coat in the gravity die casting process can be identified. The materials to be used in the preparation of the die coat can be identified. The proportions of the materials comprising the die coat can be identified. The function(s) of the die coat in gravity die casting can be identified. The procedures for mixing the die coat can be given.

Criteria 4.2A.1.2

Die temperatures lifted to, or maintained, at the correct level.

Assessor guide: observe that –

The die is maintained at the correct temperature in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for raising the temperature of the die to the correct level and then maintaining that temperature can be given. Where appropriate, the reasons for raising the temperature of the die can be given. The correct operating temperatures for a range of gravity die casting applications can be given.

Criteria 4.2A.1.3

Appropriate safety clothing and apparatus used.

Assessor guide: observe that –

The appropriate personal protective clothing and equipment is worn and correctly used at all times during the gravity die casting process.

Assessor guide: confirm that –

The hazards associated with the gravity die casting process can be identified. The appropriate safety equipment and personal protective clothing to be used in conjunction with the gravity die casting process can be identified.

Criteria 4.2A.1.4

Die coat applied in correct sequence and in a safe manner according to standard operating procedures.

Assessor guide: observe that –

The die coat is applied safely in the correct sequence in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for applying the die coat can be given. The hazards associated with the application of the die coat can be identified. The equipment to be used in the application of the die coat can be identified.

Criteria 4.2A.1.5

Die correctly located and closed.

Assessor guide: observe that –

The two halves of the die are correctly aligned and closed in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for aligning and closing the die can be given. The method of locking/securing the die halves together can be identified.

Element 4.2A.2 Carry out manual pouring**Criteria 4.2A.2.1**

Pour made in manner to reduce porosity and lamination.

Assessor guide: observe that –

The molten metal is poured so as to minimise porosity and lamination in the casting.

Assessor guide: confirm that –

The procedures to be followed when pouring molten metal can be given. The causes of porosity and lamination in castings produced by the gravity die casting process can be identified.

Criteria 4.2A.2.2

Conditions identified that contribute to inferior or rejects.

Assessor guide: observe that –

Assessor guide: confirm that –

Common defects in castings produced by the gravity die casting process can be identified. The causes of those defects can be given. The procedures to be followed to minimise the number of inferior or reject castings produced can be given.

Criteria 4.2A.2.3

Allowance is made for adequate curing time.

Assessor guide: observe that –

Adequate curing time is allowed before subsequent steps in the casting process are undertaken.

Assessor guide: confirm that –

The reasons for allowing the casting to cure can be explained. The sources of information on curing times for castings of various volumes and materials can be identified. The curing times for a range of given casting situations can be identified.

Criteria 4.2A.2.4

Pour made are continuous and at appropriate rate.

Assessor guide: observe that –

The molten metal is poured at a continuous and appropriate rate.

Assessor guide: confirm that –

The reasons for ensuring that pours are continuous and at an appropriate rate can be given. The effects of non-continuous pours and/or inappropriate pouring rates on casting quality and personal safety can be identified.

Criteria 4.2A.2.5

Monitoring of die condition carried out and re-spraying occurs as required.

Assessor guide: observe that –

The condition of the die is checked prior to each pour. Where appropriate, the die coat is repaired/replaced in accordance with standard operating procedures.

Assessor guide: confirm that –

The reasons for checking the die prior to each pour can be given. The procedures for repairing/replacing the die coat can be given. The effect on casting quality of an incomplete die coat can be identified.

Element 4.2A.3 Remove materials**Criteria 4.2A.3.1**

Parts removed and stored in a manner that minimises damage.

Assessor guide: observe that –

All castings are removed and stored in a manner that minimises damage and in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for removing castings from the die and storing them can be given. The damage that can be caused to castings through inappropriate handling and storage can be identified. The hazards associated with removing castings from the die can be identified.

Element 4.2A.4 Clean die**Criteria 4.2A.4.1**

Shot blaster operated in a safe manner and according to standard operating procedures.

Assessor guide: observe that –

The shot blaster is operated safely in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures to be followed when using a shot blaster can be given. The reasons for shot blasting the die can be given.

Criteria 4.2A.4.2

Chemical analysis is taken and remedial action applied as required to standard operating procedure.

Assessor guide: observe that –

The appropriate safety clothing and equipment is used correctly throughout the shot blasting process.

Assessor guide: confirm that –

The hazards associated with the shot blasting process can be identified. The personal safety clothing and equipment to be used in conjunction with the shot blasting process can be identified.

Criteria 4.2A.4.3

Furnace is drossed and/or degassed to standard operating procedure.

Assessor guide: observe that –

The die coat is cleaned from the body of the die in conformance to specifications and in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for removing die coat from the body of the die can be given. The specifications to be achieved in removing the die coat from the die can be identified.

Criteria 4.2A.4.4

Work area cleaned of coating and shot residue to appropriate standard.

Assessor guide: observe that –

All coating and shot residue is removed from the work area in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for removing shot and die coat residue from the work area can be given. The tools and equipment necessary to clean the work area can be identified. The storage requirements of the residue removed from the work area can be identified.

Range statement

This unit applies to gravity casting into permanent die. All work is carried out to predetermined specifications and standards of quality and safety. Work is carried out autonomously or as part of a workteam. Metals used in this area may include aluminium, aluminium alloys and other non-ferrous and ferrous metals.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with gravity die casting or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: -all tools, equipment, materials and documentation required the candidate will be permitted to refer to the following documents: -any relevant workplace procedures -any relevant product and manufacturing specifications - any relevant codes, standards, manuals and reference materials the candidate will be required to: - orally, or by other methods of communication, answer questions put by the assessor -identify colleagues who can be approached for the collection of competency evidence where appropriate - present evidence of credit for any off-job training related to this unit Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment - take responsibility for the quality of their own work - plan tasks in all situations and review task requirements as appropriate - perform all tasks in accordance with standard operating procedures - perform all tasks to specification - use accepted engineering techniques, practices, processes and workplace procedures Tasks involved will be completed within reasonable timeframes relating to typical workplace activities.

Unit MEM 4.3A A Operate pressure die casting machine

Band – Specialisation band A

Field – Casting & moulding

Unit Weight 4

Pre-requisite units - Path 1

13.4A Work safely with molten metals/glass

Element 4.3A.1 Conduct pre-operational checks

Criteria 4.3A.1.1

Start up procedure conducted according to the standard operating procedures.

Assessor guide: observe that –

All relevant work instructions, etc. are obtained in accordance with work place procedures. All pre start-up checks are carried out in accordance with standard operating procedures. The die casting machine is started in accordance with standard operating procedures.

Assessor guide: confirm that –

The pre start checks to be undertaken can be identified. The procedures for carrying out pre start checks can be given. The procedures for starting up the die casting machine can be given. The adjustments that can be made to the die casting machine to ensure correct operation of the machine can be identified.

Criteria 4.3A.1.2

If necessary, shot size adjusted.

Assessor guide: observe that –

Where appropriate, the shot size is adjusted in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for adjusting the shot size can be given. The effects of incorrect shot size on the quality of the die casting can be identified.

Criteria 4.3A.1.3

If applicable, nitrogen and/or vacuum systems checked.

Assessor guide: observe that –

Where appropriate, nitrogen and/or vacuum systems are checked for correct operation in accordance with standard operating procedures.

Assessor guide: confirm that –

The function of nitrogen and vacuum systems in the die casting process can be identified. The procedures for checking/ adjusting nitrogen and/or vacuum systems can be given.

Criteria 4.3A.1.4

If applicable, functional check made of picking robot and component gripper adjusted as necessary.

Assessor guide: observe that –

Where appropriate, the picking robot and component gripper are checked for correct operation. Where appropriate, the picking robot is adjusted in accordance with standard operating procedures.

Assessor guide: confirm that –

The correct function of a picking robot and the component gripper can be described. The procedures for adjusting the picking robot can be given. The effects of the adjustments on robot performance can be explained.

Criteria 4.3A.1.5

Die spray nozzles adjusted as necessary.

Assessor guide: observe that –

Where appropriate, the die spray nozzles are adjusted in accordance with standard operating procedures.

Assessor guide: confirm that –

The reasons for spraying the die can be given. The procedures for adjusting the die spray nozzles can be given.

Criteria 4.3A.1.6

Planning carried out that ensures efficient flow of finished product ie: breaking of runners, stacking baskets, bins, conveyors.

Assessor guide: observe that –

The sequence of operations to be performed on the die cast product is planned to ensure efficient product flow.

Assessor guide: confirm that –

The operations to be performed subsequent to the die casting of the product can be identified. The tools and equipment necessary to carry out those operations can be identified. The locations at which those operations are to be carried out can be identified. The appropriate means of transporting/conveying the die cast product between those locations can be identified. The reasons for selecting the chosen transporting/conveying method can be given.

Element 4.3A.2 Operate all functions on machine control panel**Criteria 4.3A.2.1**

Appropriate knowledge of die casting process applied in the operation, adjustment and monitoring of machine functions.

Assessor guide: observe that –

Die cast products are produced to specification using all functions of the machine control panel in accordance with standard operating procedures.

Assessor guide: confirm that –

The die casting process can be correctly described. The effect of adjusting each control on the machine control panel on the quality of the die casting produced can be explained. The procedures for adjusting the operation of the die casting machine can be given.

Element 4.3A.3 Operate machine to produce castings

Criteria 4.3A.3.1

Machine operated to standard operating procedures including maintenance of liquid metal and die operating conditions.

Assessor guide: observe that –

The die casting machine is operated in accordance with standard operating procedures. The liquid metal is maintained in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for operating the die casting machine can be given. The appropriate quantity of liquid level to be maintained can be identified. The operating parameters to be maintained during the die casting process can be identified.

Criteria 4.3A.3.2

Runners broken off.

Assessor guide: observe that –

The runners are broken off from the casting in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for removing runners from the die casting can be given.

Criteria 4.3A.3.3

Castings are visually inspected for porosity, cracks, tears, splits, sinks, cold shuts, tinning and surface crazing according to standard operating procedures.

Assessor guide: observe that –

The castings produced are visually checked for conformance to specifications in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for inspecting die castings can be given. The common faults to be found in die castings can be identified. The probable causes of each type of fault can be given.

Criteria 4.3A.3.4

Castings handled in a manner that minimises risk of damage.

Assessor guide: observe that –

All castings are handled in a manner that minimises damage to the casting in accordance with standard operating procedures.

Assessor guide: confirm that –

The damage that can be caused to castings through inappropriate handling and storage can be identified.

Criteria 4.3A.3.5

First-off castings produced, visually inspected and submitted for checking against specifications.

Assessor guide: observe that –

The first-off castings produced are submitted for checking against specifications in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for checking first-off castings for conformance to specification can be given. The specifications of the die cast product can be identified.

Element 4.3A.4 Monitor furnace

Criteria 4.3A.4.1

Furnace is maintained at optimum operating condition to standard operating procedure.

Assessor guide: observe that –

The die casting machine is shut down in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for shutting down the die casting machine can be given. The hazards associated with the shutting down of the die casting machine can be identified.

Range statement

This unit applies to all pressure die casting machines. All work is carried out to predetermined specifications and standards of quality and safety. Work may be carried out autonomously or as part of a work team.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the operation of pressure die casting machinery or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 4.4A A Prepare and mix sand for metal moulding

Band – Specialisation band A

Field – Casting & moulding

Unit Weight 4

Element 4.4A.1 Load mixer (mill/muller)

Criteria 4.4A.1.1

All pre start-up checks performed safely and according to standard operating procedures.

Assessor guide: observe that –

All relevant job instructions, specifications and procedures are obtained in accordance with work site procedures. All start checks are carried out in accordance with work site procedures.

Assessor guide: confirm that –

The pre start checks to be undertaken prior to mixing the sand can be identified. The procedures for starting the mixer can be given.

Criteria 4.4A.1.2

Formula for sand mix is determined according to standard operating procedure.

Assessor guide: observe that –

Assessor guide: confirm that –

The composition of the sand mix can be identified. The proportions of each component of the sand mix can be identified.

Criteria 4.4A.1.3

Materials measured and loaded according to formula specification.

Assessor guide: observe that –

All materials are loaded into the mixer in the correct proportions in accordance with work site procedures.

Assessor guide: confirm that –

The procedure for loading the mixer can be given. The hazards associated with the loading of the mixer can be identified.

Element 4.4A.2 Mix sand

Criteria 4.4A.2.1

Sand mixed for correct time according to specifications.

Assessor guide: observe that –

The sand is mixed for the correct time in accordance with work site procedures.

Assessor guide: confirm that –

The time for which the sand is to be mixed can be identified. The source(s) of information for a variety of sand formulas can be identified. The procedure for mixing the sand can be given.

Criteria 4.4A.2.2

Monitor performance of mixer and the condition of the sand.

Assessor guide: observe that –

The mixer is monitored for correct operation in accordance with work site procedures.

Assessor guide: confirm that –

Factors which may inhibit the correct operation of the mixer can be identified.

Criteria 4.4A.2.3

Maintain material supply, eg: water, chemicals, sand.

Assessor guide: observe that –

An adequate supply of raw materials is maintained throughout the mixing process.

Assessor guide: confirm that –

The procedures for obtaining raw materials can be given.

Criteria 4.4A.2.4

Report faults.

Assessor guide: observe that –

Where appropriate, all faults detected are reported in accordance with work site procedures.

Assessor guide: confirm that –

The procedures for reporting faults in the mixer/mixing process can be given. The authority to whom faults are reported can be identified. Common faults in the mixing process can be identified, and probable causes can be given.

Element 4.4A.3 Take and test samples**Criteria 4.4A.3.1**

Extract sample correctly.

Assessor guide: observe that –

Samples are extracted from the mixer in accordance with work site procedures.

Assessor guide: confirm that –

The procedure for taking samples from the mixer can be given. The hazards associated with taking samples from the mixer can be identified.

Criteria 4.4A.3.2

Test applied in accordance with standard operating procedure.

Assessor guide: observe that –

Sand samples are tested using appropriate tools, equipment and techniques in accordance with work site procedures.

Assessor guide: confirm that –

Tests to be performed on the sand samples taken can be identified. The procedures to be followed when testing samples can be given. The tools and equipment required to test the sand can be identified.

Criteria 4.4A.3.3

Compare test results against specification.

Assessor guide: observe that –

Test results are compared against specifications of the sand mixture.

Assessor guide: confirm that –

Criteria 4.4A.3.4

Adjustments to formula/mix made as required in accordance with standard operating procedures.

Assessor guide: observe that –

Where appropriate the recipe/mixture is adjusted to ensure that the sand conforms to specifications in accordance with work site procedures.

Assessor guide: confirm that –

Where the sand mix does not comply with the specification, the adjustments to be made to the recipe/mixture can be identified. The reasons for making the adjustments identified can be given. The effects of varying each component material on the characteristics of the sand mixture can be explained. The procedure for adjusting the sand mix can be given.

Element 4.4A.4 Discharge mixture**Criteria 4.4A.4.1**

Load discharged correctly according to standard operating procedure.

Assessor guide: observe that –

The mixture is discharged from the mixer safely in accordance with work place procedures.

Assessor guide: confirm that –

The procedure for discharging the sand mixture from the mixer can be given. The hazards associated with discharging the mixed sand can be identified.

Criteria 4.4A.4.2

Unwanted treated sand is disposed of according to standard operating procedure.

Assessor guide: observe that –

The unwanted treated sand is disposed of in accordance with work place procedures.

Assessor guide: confirm that –

The procedures for disposing of unwanted treated sand can be explained. The environmental hazards associated with disposing of unwanted treated sand incorrectly can be explained.

Element 4.4A.5 Clean mixer**Criteria 4.4A.5.1**

Mixer is shut down to standard safety and operating procedures.

Assessor guide: observe that –

The mixer is shut down safely in accordance with workplace procedures.

Assessor guide: confirm that –

The procedures for shutting down the mixer can be explained.

Criteria 4.4A.5.2

Mixer cleaned according to standard operating procedures.

Assessor guide: observe that –

The mixer is left in a safe and clean condition.

Assessor guide: confirm that –

The reason for cleaning mixer after use can be given.

Range statement

This unit applied to the mixing of sand in continuous and batch type mills. All work is carried out to predetermined specifications and standards of quality and safety. Work is carried out autonomously or as part of a team and in accordance with legislative and statutory requirements.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the preparation and mixing of sand for metal moulding or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 4.5A A Produce moulds and cores by hand (jobbing)

Band – Specialisation band A

Field – Casting & moulding

Unit Weight 16

Pre-requisite units - Path 1

9.2A Interpret technical drawing

18.1A Use hand tools

Element 4.5A.1 Determine job requirements

Criteria 4.5A.1.1

Drawing, instructions and specifications interpreted and understood.

Assessor guide: observe that –

All relevant specifications, drawings, instructions and procedures are obtained in accordance with work place procedures.

Assessor guide: confirm that –

The specifications to be achieved can be identified. A variety of pattern types and their application can be identified. The features of a sand mould and their function can be identified. A variety of core types and their application can be identified.

Element 4.5A.2 Determine sequence of operation

Criteria 4.5A.2.1

Sequence of operation including job set up is determined for maximum efficiency and to meet job specifications.

Assessor guide: observe that –

The sequence of operation including job set up is determined in accordance with work place procedures.

Assessor guide: confirm that –

The tasks to be undertaken can be identified. The procedures to be followed in producing moulds and cores by hand can be described.

Criteria 4.5A.2.2

Appropriate material selected.

Assessor guide: observe that –

The appropriate materials for producing moulds and cores selected and obtained in accordance with work place procedures.

Assessor guide: confirm that –

The procedures for obtaining the materials for producing moulds and cores can be identified.

Element 4.5A.3 Select inspect and prepare pattern equipment

Criteria 4.5A.3.1

Pattern equipment correctly identified from specifications according to standard operating procedure.

Assessor guide: observe that –

The pattern equipment correctly identified from specifications in accordance with work place procedures.

Assessor guide: confirm that –

The procedures for obtaining patterns can be identified. All parts of the patterns can be identified.

Criteria 4.5A.3.2

Pattern equipment inspected to specifications and damaged patterns are identified for repair or replacement to standard operating procedure.

Assessor guide: observe that –

The pattern is checked for conformance to specifications in accordance with work place procedures.

Assessor guide: confirm that –

The most appropriate measuring devices for checking patterns can be identified. The procedures for checking patterns can be identified. The procedures for repair or replacement of damaged patterns can be identified.

Criteria 4.5A.3.3

Pattern is assembled to specification.

Assessor guide: observe that –

The pattern is assembled to specifications in accordance with work place procedures.

Assessor guide: confirm that –

The procedure for assembling the pattern can be identified.

Criteria 4.5A.3.4

Pattern equipment set up to specification according to standard operating procedure.

Assessor guide: observe that –

The pattern and all necessary mould features are appropriately positioned in the moulding box in accordance with work place procedures.

Assessor guide: confirm that –

The procedures for setting up the pattern equipment can be identified. The procedures for preparing two and three box moulds can be given. The reason for choosing the selected position and size of each mould feature can be explained.

Element 4.5A.4 Make mould and core

Criteria 4.5A.4.0

Core positioned in prints utilising chaplets and chills as required and vented to specification according to standard operating procedure.

Assessor guide: observe that –

The core is positioned in prints utilising chaplets and chills, vented in accordance with work place procedures.

Assessor guide: confirm that –

The procedures for positioning the core in prints and venting can be identified. The use of chaplets and chills can be explained.

Criteria 4.5A.4.1

Select and position appropriate moulding/core-making equipment according to standard operating procedure.

Assessor guide: observe that –

The moulding/core-making equipment are appropriately positioned in the moulding box in accordance with work place procedures.

Assessor guide: confirm that –

The procedures for setting up the moulding/core-making equipment can be identified. The reason for choosing the selected position and size of each mould/core can be explained.

Criteria 4.5A.4.1

Mould closed and checked for compliance to component specification in accordance with standard operating procedure.

Assessor guide: observe that –

The mould closed and checked for compliance to component specification in accordance with work place procedures.

Assessor guide: confirm that –

The procedures for closing the mould, and checking for compliance to component specification can be explained.

Criteria 4.5A.4.2

Select appropriate moulding media to produce mould and core to specification.

Assessor guide: observe that –

The appropriate moulding media for producing moulds and cores selected and obtained in accordance with work place procedures.

Assessor guide: confirm that –

A range of moulding media and their applications can be given. The appropriate moulding media for the object to be cast can be identified. The reasons for selecting the chosen moulding media can be given.

Criteria 4.5A.4.2

Mould secured according to standard operating procedure.

Assessor guide: observe that –

The mould secured in accordance with work place procedures.

Assessor guide: confirm that –

The procedures and equipment required for securing the mould can be explained.

Criteria 4.5A.4.3

Pouring basin is selected or manufactured to specification and positioned in accordance with standard operating procedure.

Assessor guide: observe that –

The pouring basin is selected and/or manufactured to specification, and positioned in accordance with work place procedures.

Assessor guide: confirm that –

The procedures for selecting and positioning the pouring basin can be explained. The procedures, tools and equipment necessary to manufacture and repair damaged pouring basins can be identified.

Criteria 4.5A.4.3

Use moulding media to produce mould and core according to standard operating procedure.

Assessor guide: observe that –

The pattern and all necessary mould features are packed with moulding media in accordance with work place procedures.

Assessor guide: confirm that –

The procedures for packing the mould boxes with moulding media can be given.

Criteria 4.5A.4.4

Mould and cores rammed up with joints and drawbacks as required to standard operating procedure.

Assessor guide: observe that –

The mould and cores rammed up with joints and drawbacks in accordance with work place procedures.

Assessor guide: confirm that –

The procedures for ramming up moulds and cores with joints and drawbacks can be given.

Criteria 4.5A.4.5

Parting and stripping systems are utilised in accordance with standard operating procedure.

Assessor guide: observe that –

The most appropriate mould parting and stripping system is selected and used in accordance with work place procedures.

Assessor guide: confirm that –

A range of parting and stripping systems and their applications can be given. The reasons for selecting the chosen parting and stripping systems can be given.

Criteria 4.5A.4.6

Loose pieces, vents, risers and runners positioned and secured as required to standard operating procedure.

Assessor guide: observe that –

The loose pieces, vents, risers and runners positioned and secured in accordance with work place procedures.

Assessor guide: confirm that –

The procedures for positioning and securing loose pieces, vents, risers and runners can be given.

Criteria 4.5A.4.7

Pattern and loose pieces removed from mould and core box in a safe manner least likely to cause damage to the pattern and in accordance with standard operating procedure.

Assessor guide: observe that –

The loose pieces, vents, risers and runners removed in accordance with work place procedures.

Assessor guide: confirm that –

The procedures for removing loose pieces, vents, risers and runners can be given. The precautions to be taken during removing loose pieces, vents, risers and runners to minimise damage to the mould can be given.

Criteria 4.5A.4.8

Mould is inspected and repaired as required.

Assessor guide: observe that –

The mould is visually inspected for conformance to specifications and where appropriate, the mould is repaired in accordance with work place procedures.

Assessor guide: confirm that –

The procedures for repairing moulds can be given. The tools and equipment necessary to repair damage moulds can be identified. Common mould defects and their causes can be identified. Mould defects which are repairable can be identified.

Criteria 4.5A.4.9

Mould and core cleaned and painted according to specification using standard operating procedure.

Assessor guide: observe that –

The mould and core is cleaned and painted in accordance with work place procedures.

Assessor guide: confirm that –

The procedures for cleaning and painting moulds and cores can be identified.

Element 4.5A.5 Clean and restore work area**Criteria 4.5A.5.1**

All materials/debris cleared and work site cleaned and left in a safe state.

Assessor guide: observe that –

The work site cleaned of all materials/debris and left in a safe state in accordance with work place procedures.

Assessor guide: confirm that –

The hazards associated with working in a moulding environment can be identified. The housekeeping procedures to be employed to minimise hazards in the moulding environment can be explained.

Criteria 4.5A.5.2

Unwanted treated sand is disposed of according to standard operating procedure.

Assessor guide: observe that –

The unwanted treated sand is disposed of in accordance with workplace procedures.

Assessor guide: confirm that –

The procedures for disposing of unwanted treated sand can be explained. The environmental hazards associated with disposing of unwanted treated sand incorrectly can be explained.

Range statement

This unit applies to the production of sand moulds and cores by manual (jobbing) methods. All work is carried out to predetermined specifications and standards of quality and safety. Work may be done autonomously or in a team environment. The types of patterns may include flatback and plated patterns, multi-joint, strickle, consumable, split patterns, loose piece patterns, patterns requiring odd sides, cored moulds, drag and cope mould etc. A range of moulding media such as, green sand, shell sand, chemically bonded media etc. may be used. Unwanted treated moulding/core sand is disposed of according to legislative and statutory requirements. Where lifting and moving moulds and cores requires the use of mobile load shifting equipment or overhead cranes appropriate manual handling units should also be selected. Where the securing of moulds requires welding skills, see unit 5.12A (Perform routine manual metal arc welding) and Unit 5.50 (Perform routine gas metal arc welding) as appropriate.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the production of moulds and cores or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 4.6A A Operate sand moulding and core making machines

Band – Specialisation band A

Field – Casting & moulding

Unit Weight 8

Element 4.6A.1 Determine job requirements

Criteria 4.6A.1.1

Instructions and specifications interpreted and understood.

Assessor guide: observe that –

All relevant specifications, drawings, instructions and procedures are obtained in accordance with work place procedures.

Assessor guide: confirm that –

The tasks to be undertaken can be identified. The specifications to be achieved can be identified. The procedures to be followed in producing moulds and cores by machine can be described. A variety of pattern types and their application can be identified. The features of a sand mould and their function can be identified. A variety of core types and their application can be identified.

Element 4.6A.2 Conduct pre-operational checks

Criteria 4.6A.2.1

Pattern/core box selected and inspected to specifications and cleaned as required. Damaged patterns/core boxes are identified for repair or replacement to standard operating procedure.

Assessor guide: observe that –

The pattern/core is correctly set up in the bolster in accordance with standard operating procedures. The core box is correctly located in the machine in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for setting up the pattern/core in the bolster can be given. The correct method of locating the core box in the machine can be identified.

Criteria 4.6A.2.2

Pattern/core box is set up in bolster and core box according to standard operating procedures.

Assessor guide: observe that –

The pattern is checked for conformance to specification and inspected for signs of damage in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for checking patterns for conformance to specifications can be given. The appropriate measuring devices to be used to check the pattern for conformance to specification can be identified. Examples of damage to patterns and their effect on casting quality can be given.

Element 4.6A.3 Operate machine to produce mould/cores**Criteria 4.6A.3.1**

Select appropriate moulding media to produce mould and core to specification.

Assessor guide: observe that –

The appropriate moulding media for producing moulds and cores selected and obtained in accordance with workplace procedures.

Assessor guide: confirm that –

A range of moulding media and their applications can be given. The appropriate moulding media for the object to be cast can be identified. The reasons for selecting the chosen moulding media can be given.

Criteria 4.6A.3.2

Moulds/cores filled to specification according to standard operating procedures.

Assessor guide: observe that –

The pattern and all necessary mould features are filled with moulding media in accordance with workplace procedures.

Assessor guide: confirm that –

The procedures for filling the mould boxes with moulding media can be given.

Criteria 4.6A.3.3

Machine is operated in accordance with standard operating procedures.

Assessor guide: observe that –

The machine is operated safely in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for operating the moulding/core making machine can be given. The hazards associated with the operation of moulding/core making machines can be given.

Criteria 4.6A.3.4

Machine is unloaded safely to standard operating procedures.

Assessor guide: observe that –

The machine is unloaded safely in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for unloading the moulding/core making machine can be given.

Criteria 4.6A.3.5

Moulds/cores are stripped, inspected and painted as required according to standard operating procedures.

Assessor guide: observe that –

The moulds/cores are stripped in accordance with standard operating procedure. The moulds/cores are visually inspected for conformance to specification. The moulds/cores are repaired in accordance with standard operating procedure. Where appropriate moulds/cores are painted with the appropriate medium in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for stripping the mould can be given. The precautions to be taken during mould stripping to minimise damage to the mould can be identified. The procedures for repairing the moulds and cores can be given. The tools and equipment necessary to repair damaged moulds and cores can be identified. Common mould/core defects and their causes can be identified. Those defects that are repairable can be recognised. The purpose of painting moulds/cores can be given. The procedures for painting moulds/cores can be given. The appropriate painting medium can be identified. The reasons for selecting the chosen painting medium can be explained.

Element 4.6A.4 Assemble moulds/cores**Criteria 4.6A.4.1**

Moulds/cores are dried, glued and vented as required to specification and closed in accordance with standard operating procedures.

Assessor guide: observe that –

Where appropriate, the core(s) are assembled and vented in conformance to specifications. Where appropriate, the mould is closed and secured against lift in accordance with standard operating procedure.

Assessor guide: confirm that –

The specification for the core(s) can be identified. The method of core assembly and venting can be identified. The procedures for closing and securing the mould boxes can be given. The methods of securing the mould against lift can be identified. The causes of lift in the moulding process can be explained.

Criteria 4.6A.4.2

Runner bush is set to specification as required.

Assessor guide: observe that –

The runner bush is set for pouring in accordance with standard operating procedure.

Assessor guide: confirm that –

The function of the runner bush can be explained. The procedures for setting the runner bush can be given.

Element 4.6A.5 Clean and restore work area**Criteria 4.6A.5.1**

All materials/debris cleared and work site cleaned and left in a safe state.

Assessor guide: observe that –

The work site cleaned of all materials/debris and left in a safe state in accordance with workplace procedures.

Assessor guide: confirm that –

The hazards associated with working in a moulding environment can be identified. The housekeeping procedures to be employed to minimise hazards in the moulding environment can be explained.

Criteria 4.6A.5.2

Unwanted treated sand is disposed of according to standard operating procedures.

Assessor guide: observe that –

The unwanted treated sand is disposed of in accordance with workplace procedures.

Assessor guide: confirm that –

The procedures for disposing of unwanted treated sand can be explained. The environmental hazards associated with disposing of unwanted treated sand incorrectly can be explained.

Range statement

This unit applies to the operation of a range of automatic and semi-automatic sand moulding and core making machines. Work may be carried out autonomously or as part of a work team. Work is carried out to predetermined specification and safety standards of quality and safety. A range of moulding media such as green sand, shell sand, chemically bonded media etc. may be used. Unwanted treated moulding/core sand is disposed of according to legislative and statutory requirements. Where lifting and moving moulds and cores requires the use of mobile load shifting equipment or overhead cranes appropriate materials handling units should also be selected.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the operation of moulding and core making machines or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 4.7A A Pour molten metal

Band – Specialisation band A

Field – Casting & moulding

Unit Weight 4

Pre-requisite units - Path 1

13.4A Work safely with molten metals/glass

Element 4.7A.1 Prepare for pouring molten metal

Criteria 4.7A.1.1

Condition of mould checked according to standard operating procedures.

Assessor guide: observe that –

All relevant work instructions, specifications and procedures obtained in accordance with standard operating procedures.

Assessor guide: confirm that –

The tasks to be undertaken can be identified. The specifications of the liquid metal to be poured can be identified. The appropriate pouring sequence can be identified. The reasons for choosing the selected pouring sequence can be given. Any hazards associated with the selected pouring sequence can be identified. The temperature at which the liquid metal is to be poured can be identified.

Criteria 4.7A.1.2

Condition of ladle checked according to standard operating procedure.

Assessor guide: observe that –

Where appropriate, relevant personnel are consulted with respect to quantities of liquid metal required.

Assessor guide: confirm that –

The quantity of liquid metal to be poured is identified from available information. Where appropriate, personnel to be consulted with respect to the quantities of liquid metal required can be identified.

Criteria 4.7A.1.3

Temperature of molten metal checked for conformance to specification and pouring method sequenced to standard operating procedures.

Assessor guide: observe that –

The condition of the ladle is checked for conformance to specifications in accordance with standard operating procedures.

Assessor guide: confirm that –

The ladle specifications can be identified. The procedures for checking the ladle can be given. Common ladle defects/non-conformances can be identified. The procedures for rectifying common ladle defects/non-conformances can be given.

Criteria 4.7A.1.4

Capacity of the required pour is identified against specification according to standard operating procedures.

Assessor guide: observe that –

The capacity of the ladle is checked against the required pour in accordance with standard operating procedures.

Assessor guide: confirm that –

The consequences of undersizing the ladle can be identified.

Element 4.7A.2 Preheat or prepare ladle**Criteria 4.7A.2.1**

Ladle is preheated/prepared to receive molten metal.

Assessor guide: observe that –

The ladle is preheated to the appropriate temperature to receive the liquid metal in accordance with standard operating procedures.

Assessor guide: confirm that –

The temperature to which the ladle is to be preheated can be identified. The procedures for preparing the ladle to receive hot metal can be given. The possible consequences of pouring liquid metal into an inappropriately preheated/prepared ladle can be explained.

Element 4.7A.3 Transfer ladle to furnace**Criteria 4.7A.3.1**

Safety clips checked according to standard operating procedures.

Assessor guide: observe that –

The safety clips are checked for correct operation in accordance with standard operating procedures.

Assessor guide: confirm that –

The purpose of the safety clips can be explained. The procedures for checking the correct operation of the safety clips can be given.

Criteria 4.7A.3.2

Ladle filled and transferred to pouring area in accordance with standard operating procedures.

Assessor guide: observe that –

The ladle is filled safely from the furnace in accordance with standard operating procedures. The ladle is transferred safely to the pouring area in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for filling the ladle can be given. The hazards associated with the filling of the ladle with liquid metal can be identified. The procedures for transferring the ladle to the pouring area can be given. The hazards associated with transferring liquid metal in a ladle can be identified. The safety precautions to be taken during filling and transfer of the ladle can be identified.

Criteria 4.7A.3.3

Additives determined from specification and added to molten metal as required.

Assessor guide: observe that –

Assessor guide: confirm that –

Element 4.7A.4 Maintain quality of metal as required

Criteria 4.7A.4.1

Slag/dross removed where necessary.

Assessor guide: observe that –

Where appropriate, the slag/dross is safely removed from the ladle in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for removing slag/dross from the ladle can be given. The safety precautions to be taken when removing slag/dross from the ladle can be identified.

Criteria 4.7A.4.2

Temperature monitored as required.

Assessor guide: observe that –

Where appropriate, the temperature of the liquid metal in the ladle is monitored in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedure for monitoring the temperature of liquid metal in the ladle can be given. The appropriate measuring device for monitoring the temperature of liquid metal in the ladle can be identified.

Criteria 4.7A.4.3

Chemical analysis is taken and remedial action applied as required to standard operating procedures.

Assessor guide: observe that –

Where appropriate, a chemical analysis of the liquid metal in the ladle is taken in accordance with standard operating procedures.

Assessor guide: confirm that –

The appropriate remedial action required to maintain the chemical analysis in accordance with standard operating procedure can be identified.

Element 4.7A.5 Pour molten metal

Criteria 4.7A.5.1

Personnel in immediate area of the metal pour informed that pour is to take place and appropriate safety clothing and equipment is used as specified in standard operating procedures.

Assessor guide: observe that –

The characteristics of the mould are checked for conformance to specifications in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for checking moulds prior to pouring can be given. The characteristics of the mould to be checked can be identified. The consequences of pouring liquid metal into a mould whose characteristics do not conform to specifications can be explained.

Criteria 4.7A.5.2

Metal is poured safely to specification and in accordance with standard operating procedures.

Assessor guide: observe that –

A test bar is poured in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for pouring test bars can be given. The reasons for pouring test bars can be explained.

Criteria 4.7A.5.3

Metal is poured at an appropriate and continuous rate.

Assessor guide: observe that –

The liquid metal is poured so as to minimise porosity and lamination in the casting in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures to be followed when pouring liquid metal into moulds can be given. The causes of porosity and lamination in castings can be identified.

Criteria 4.7A.5.4

Test bar is poured in accordance with standard operating procedures as required.

Assessor guide: observe that –

The liquid metal is poured at a continuous and appropriate rate in accordance with standard operating procedures.

Assessor guide: confirm that –

The reasons for ensuring that pours are continuous and at an appropriate rate can be given. The effects of non-continuous pours and/or inappropriate pouring rates on casting quality and personal safety can be identified.

Element 4.7A.6 Empty excess metal from ladle**Criteria 4.7A.6.1**

Pigs poured and tagged.

Assessor guide: observe that –

Any unused liquid metal is poured into pigs and correctly tagged in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for pouring pigs can be given. The reasons for pouring pigs and tagging them can be explained.

Element 4.7A.7 Return ladle**Criteria 4.7A.7.1**

Ladle emptied, cleaned and maintained according to standard operating procedures.

Assessor guide: observe that –

The ladle is emptied, cleaned and maintained in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for emptying, cleaning and maintaining ladles can be given. The tools and equipment necessary to clean and maintain ladles can be identified. The safety precautions to be taken when cleaning and maintaining ladles can be identified.

Range statement

This unit applies to manual pouring of molten metal as part of foundry processes. Work may be carried out autonomously or as part of a work team and to predetermined specifications and standards of quality and safety. This unit should not be selected for one-off pouring of molten metal undertaken for sample castings in toolmaking manufacturing and maintenance of wires, ropes and slings, re-metalling of bearings, etc. Operational maintenance of ladles may include routine lubrication of ladles as well as repairs and cleaning of refractory. Where lifting and moving of ladles requires the use of overhead cranes appropriate materials handling units should also be selected.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the pouring of liquid metal or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 4.8A A Fettle and trim metal castings/forgings

Band – Specialisation band A

Field – Casting & moulding

Unit Weight 4

Pre-requisite units - Path 1

18.1A Use hand tools

18.2A Use power tools/hand held operations

Element 4.8A.1 Determine job requirements

Criteria 4.8A.1.1

Job instructions and specifications interpreted and understood.

Assessor guide: observe that –

Job instructions/specifications are obtained in accordance with work site procedures.

Assessor guide: confirm that –

The tasks to be undertaken can be identified. The specifications to be achieved can be identified.

Criteria 4.8A.1.2

Correct mouldings and/or castings/forgings located and arranged for efficient processing.

Assessor guide: observe that –

The correct castings are located. The castings are arranged for efficient processing in accordance with standard operating procedures.

Assessor guide: confirm that –

Element 4.8A.2 Observe safety requirements

Criteria 4.8A.2.1

Personal protection equipment selected and used correctly.

Assessor guide: observe that –

The excess metal to be removed is correctly identified. The casting is visually checked for suitability for further processing in accordance with standard operating procedures.

Assessor guide: confirm that –

The reasons for removing excess metal can be given. Casting defects that cannot be rectified by fettling or trimming can be identified. The reasons for not proceeding with the processing of castings with visually detected defects can be given.

Criteria 4.8A.2.2

Castings/forgings handled using appropriate manual or mechanical handling procedures.

Assessor guide: observe that –

The appropriate handling procedure is carried out in accordance with standard operating procedures.

Assessor guide: confirm that –

The appropriate handling procedure can be identified.

Criteria 4.8A.2.3

Castings/forgings are stored or positioned in a safe manner.

Assessor guide: observe that –

All casting and forging are positioned safely in accordance with standard operating procedures.

Assessor guide: confirm that –

The standard operating procedure for safely positioning castings/forging can be identified.

Element 4.8A.3 Identify excess material for removal**Criteria 4.8A.3.1**

Remove casting from mould and/or remove sand media from casting as required.

Assessor guide: observe that –

Where appropriate, hand tools are correctly selected and used in accordance with standard operating procedures.

Assessor guide: confirm that –

Hand tools and their application to fettling and trimming processes can be identified.

Criteria 4.8A.3.2

Castings/forgings visually checked as suitable for further processing and excess metal correctly identified in accordance with standard operating procedures.

Assessor guide: observe that –

Where appropriate, power tools are correctly selected and used in accordance with standard operating procedures.

Assessor guide: confirm that –

Power tools and their application to fettling and trimming processes can be identified. The grades of grinding disks/belts and their application can be given.

Element 4.8A.4 Select correct tools and equipment**Criteria 4.8A.4.1**

Appropriate cleaning method selected. Rumbling/shot blast/sand blast equipment set to specification and used in accordance with standard operating procedures as required.

Assessor guide: observe that –

Excess metal is removed using appropriate methods and equipment in accordance with standard operating procedures.

Assessor guide: confirm that –

Appropriate combinations of tools and equipment can be identified to remove excess metal efficiently and achieve specified surface finishes.

Criteria 4.8A.4.2

Appropriate hand tools selected and used eg: files, chisels, hammers etc.

Assessor guide: observe that –

Assessor guide: confirm that –

Criteria 4.8A.4.3

Appropriate power tools and accessories selected and used eg: saws, croppers, grinding disks/belts (including grades), swing and pedestal grinders etc.

Assessor guide: observe that –

Assessor guide: confirm that –

Element 4.8A.5 Remove excess material**Criteria 4.8A.5.1**

Excess metal (eg: runners, risers and flashing) removed using appropriate methods and equipment in accordance with standard operating procedures.

Assessor guide: observe that –

The appropriate personal protection equipment is selected and worn. All equipment safety guards are in place and used correctly.

Assessor guide: confirm that –

The hazards associated with fettling and trimming metal can be identified. Personal protective equipment and its application can be identified.

Criteria 4.8A.5.2

Excess metal suitable for recycling identified in accordance with standard operating procedures.

Assessor guide: observe that –

Castings are handled in accordance with legal requirements, company procedures and National Occupational Health and Safety Commission Guidelines. Where appropriate, mechanical handling equipment is used safely in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for safe lifting and manual handling of castings can be given. The mechanical handling devices available at the work site and their application can be identified.

Criteria 4.8A.5.3

Excess metallic materials are identified from specifications and isolated as required according to standard operating procedures.

Assessor guide: observe that –

The excess material to be trimmed is identified in accordance with standard operating procedures.

Assessor guide: confirm that –

Element 4.8A.6 Castings/forgings quality assessed**Criteria 4.8A.6.1**

Castings/forgings visually checked for conformance with specifications following standard operating procedures.

Assessor guide: observe that –

Castings are visually checked for conformance to specification in accordance with standard operating procedures.

Assessor guide: confirm that –

Criteria 4.8A.6.2

Castings/forgings rejected or set aside and identified for further consideration or remedial action in accordance with standard operating procedures.

Assessor guide: observe that –

Where appropriate, castings are rejected, set aside for further consideration or remedial action in accordance with standard operating procedures.

Assessor guide: confirm that –

The casting defects that can be remedied by further work can be identified. The casting defects that cannot be remedied by further work can be identified.

Criteria 4.8A.6.3

Faults reported/recorded as required using standard operating procedures.

Assessor guide: observe that –

Where appropriate, casting defects are reported/recorded in accordance with standard operating procedures.

Assessor guide: confirm that –

The reporting/recording requirements for casting defects detected can be identified.

Element 4.8A.7 Protects castings/forgings from damage**Criteria 4.8A.7.**

Assessor guide: observe that –

Assessor guide: confirm that –

Range statement

This unit is intended to apply to the skills used in the dressing of castings/forgings formed by a variety of processes. Work is carried out autonomously or as part of a work team. Equipment used may include saws, croppers, grinders, rumbling equipment etc. Flame and air arc cutting equipment is covered by another unit. For preparation of surfaces using blasting processes including hydro-blast, refer to Unit 8.11A (Undertake surface preparation using solvents and/or mechanical means). Where lifting and moving moulds and/or castings/forgings requires the use of mobile loadshifting equipment or overhead cranes, appropriate materials handling units should also be selected. Where production packaging and labelling of the finished product is required Unit 11.6A (Production packaging) should also be considered.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with fettling and trimming of metal castings, or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 4.9A B Inspect/test castings/forgings

Band – Specialisation band A

Field – Casting & moulding

Unit Weight 6

This unit covers the competencies required to inspect castings and forgings including assessing the quality of the casting/forging, identifying defects, testing the castings/forging and instigating corrective action.

Pre-requisite units - Path 1

4.2A Gravity die casting

9.2A Interpret technical drawing

13.4A Work safely with molten metals/glass

Pre-requisite units - Path 2

4.3A Operate pressure die casting machine

9.2A Interpret technical drawing

13.4A Work safely with molten metals/glass

Pre-requisite units - Path 3

4.5A Produce moulds and cores by hand (jobbing)

9.2A Interpret technical drawing

18.1A Use hand tools

Pre-requisite units - Path 4

6.1A Hand forging

9.2A Interpret technical drawing

18.1A Use hand tools

Pre-requisite units - Path 5

6.2A Hammer forging

9.2A Interpret technical drawing

Element 4.9A.1 Assess castings/forgings

Criteria 4.9A.1.1

Drawings correctly interpreted

Assessor guide: observe that –

All relevant drawings, instructions and specifications are obtained in accordance with workplace procedures

Assessor guide: confirm that –

The key features and specifications of the castings/forgings can be correctly identified

Criteria 4.9A.1.2

Measuring equipment correctly selected and used casting/forging for conformance to specification

Assessor guide: observe that –

The appropriate measuring equipment is used to check the features of the casting/forging can be identified The

Assessor guide: confirm that –

The appropriate measuring equipment to measure the key reasons for selecting the chosen measuring equipment can be given

Element 4.9A.2 Identify casting/forging defects

Criteria 4.9A.2.1

Correct sampling procedure applied according to standard operating procedures

Assessor guide: observe that –

The correct sampling procedure is used to check castings/forgings for defects in accordance with standard operating procedures

Assessor guide: confirm that –

The procedures for sampling castings/forgings can be given The frequency with which castings/forgings are to be checked for defects can be identified

Criteria 4.9A.2.2

Defective castings/forgings are correctly identified and isolated

Assessor guide: observe that –

Where appropriate, defective castings/forgings are identified and isolated in accordance with standard operating procedures

Assessor guide: confirm that –

The procedures for isolating defective castings/forgings can be given The defects for which castings/forgings are to be tested can be identified The reasons for carrying out tests for each of these types of defect can be explained

Criteria 4.9A.2.3

Possible causes of defects identified

Assessor guide: observe that –

Assessor guide: confirm that –

The possible causes for each type of casting/forging defect identified can be given

Element 4.9A.3**Test castings/forgings****Criteria 4.9A.3.1**

Appropriate testing carried out to assess surface defects using standard operating procedures

Assessor guide: observe that –

Castings/forgings are tested for surface defects using appropriate tools, equipment and techniques in accordance with standard operating procedures

Assessor guide: confirm that –

The procedures for testing castings/forgings for surface defects can be given The methods of testing for surface defects can be identified The tools, equipment and techniques necessary for testing surface defects can be identified The reasons for selecting the chosen test method can be explained

Criteria 4.9A.3.2

Appropriate testing carried out to assess bend, tension, hardness, tensile, strength etc. as required using standard operating procedures

Assessor guide: observe that –

The physical properties of the cast metal are tested using appropriate tools, equipment and techniques in accordance with standard operating procedures

Assessor guide: confirm that –

The procedures for testing the physical properties of the cast metal can be given The methods of testing for each of the physical properties of the cast metal can be identified The tools, equipment and techniques necessary for testing the physical properties of the cast metal can be identified The reasons for selecting the chosen test methods can be explained

Criteria 4.9A.3.3

Non-destructive testing is carried out to assess internal defects as required using standard operating procedures

Assessor guide: observe that –

Castings/forgings are tested for cracks and internal defects using appropriate non-destructive tests in accordance with standard operating procedures

Assessor guide: confirm that –

The procedures for carrying out non-destructive tests on castings/forgings for cracks and internal defects can be given Non-destructive testing methods and their application can be given The tools, equipment and techniques required to carry out each of the non-destructive tests can be identified The reasons for selecting the chosen non-destructive test(s) can be explained

Criteria 4.9A.3.4

If applicable, pressure testing of castings/forgings is performed

Assessor guide: observe that –

Where appropriate, castings/forgings are pressure tested using appropriate tools, techniques and equipment in accordance with standard operating procedures

Assessor guide: confirm that –

The procedures for pressure testing castings/forgings can be given The safety precautions to be taken when pressure testing castings/forgings can be identified The tools, techniques and equipment necessary to pressure test castings/forgings can be identified

Criteria 4.9A.3.5

All test results are accurately recorded and/or reported to appropriate authority using standard operating procedures

Assessor guide: observe that –

All test results are accurately recorded in accordance with standard operating procedures Where appropriate, test results are reported to the appropriate authority in accordance with standard operating procedures

Assessor guide: confirm that –

The procedures for recording and reporting test results can be given The person to whom test results are to be reported can be identified The reasons for accurately recording all test results can be explained

Element 4.9A.4 Instigate corrective action**Criteria 4.9A.4.1**

Knowledge of casting/forging process is applied in the alteration of the process to eliminate identified faults

Assessor guide: observe that –

All test results are obtained in accordance with standard operating procedures Proposed changes to the casting/forging process are reported to the appropriate authority/instigated in accordance with standard operating procedures

Assessor guide: confirm that –

Any defects detected in the casting/forging can be identified Any physical properties of the cast metal not conforming to specification can be identified The probable causes of any defects or non-conformances detected can be given Changes to the casting/forging process are proposed to eliminate the identified defects/non-conformances The reasons for the proposed alterations to the casting/forging process can be explained The person to whom proposed changes are to be reported can be identified The procedures for reporting/instigating proposed changes to the casting/forging process can be given

Range statement

This unit applies to persons required to respond to quality problems in a range of castings/forgings. The acceptance/inspection of first off products may also be required. Testing activities will be in accordance with standard operating procedure and may include where required, dimensional inspection, crack detection, dye/penetrant inspection, magnetic particle, x-ray and ultrasound etc. Work is carried out autonomously or as part of a work team, to predetermined specifications and standards of quality and safety. Where knowledge of the casting/forging process is not required and inspection skills are needed Unit 15.4A (Perform inspection (basic)) may be considered instead of this unit.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the inspection of castings or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 4.10A A Develop and manufacture wood patterns

Band – Specialisation band A

Field – Casting & moulding

Unit Weight 20

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices

2.13C5 Perform mathematical computations

9.2A Interpret technical drawing

18.2A Use power tools/hand held operations

2.7C10 Perform computations - basic

4.18A General woodworking machine operations

12.6A Mark off/out (general engineering)

2.8C10 Perform computations

9.1A Draw and interpret sketch

18.1A Use hand tools

Element 4.10A.1 Determine job requirements

Criteria 4.10A.1.1

Job instructions and specifications interpreted and understood.

Assessor guide: observe that –

All relevant written instructions, sketches or drawings have been received and used.

Assessor guide: confirm that –

Those instructions, sketches or drawings have been interpreted correctly.

Criteria 4.10A.1.2

Moulding/casting techniques and foundry processes are applied to determine type of wood pattern required.

Assessor guide: observe that –

The pattern/corebox will meet the requirements for the predetermined moulding/casting techniques and foundry process.

Assessor guide: confirm that –

The moulding/casting techniques and foundry process can be identified.

Criteria 4.10A.1.3

Appropriate timber/timber composites selected to meet specification.

Assessor guide: observe that –

The appropriate timber has been selected for ease of working, stability, durability and strength, to suit the predetermined moulding/casting techniques and foundry process.

Assessor guide: confirm that –

The consequences of selecting inappropriate materials, can be identified.

Element 4.10A.2 Develop and lay out wood patterns

Criteria 4.10A.2.1

Calculate pattern parameters eg: angles, tapers, clearances, contractions etc. to specification.

Assessor guide: observe that –

The calculations necessary for manufacturing the pattern and corebox have been carried out, i.e. contraction, taper, clearances, etc.

Assessor guide: confirm that –

The calculus necessary to carry out those calculations can be identified.

Criteria 4.10A.2.2

Lay out pattern showing tapers, machining allowances, core prints and method of construction to specification.

Assessor guide: observe that –

The pattern/corebox has been laid out showing contraction, tapers, machining allowance, core prints, clearances, pattern/corebox construction, and conforms to drawings, sketches, tolerances and to the predetermined specifications.

Assessor guide: confirm that –

The consequences of not laying out the pattern in detail and with all known specifications can be identified.

Criteria 4.10A.2.3

Develop and manufacture jigs and fixtures to aid wood pattern manufacture as required.

Assessor guide: observe that –

Any jigs and fixtures required for manufacture have been developed and manufactured.

Assessor guide: confirm that –

The reasons why those particular manufacturing aids are required, and their use identified.

Element 4.10A.3 Manufacture wood patterns**Criteria 4.10A.3.1**

Materials marked out and construction developed to meet specification.

Assessor guide: observe that –

The construction of the patterns/corebox will meet the requirements for the predetermined moulds/casting technique and foundry process.

Assessor guide: confirm that –

The reason why that particular construction has been used and that other methods can be identified and the consequences of using those methods.

Criteria 4.10A.3.2

Using acceptable wood pattern making techniques, procedures and utilising appropriate hand and hand held power tools, pattern or pattern component parts are produced to size and shape and checked for compliance to specifications.

Assessor guide: observe that –

The completed pattern/corebox, complies with the pattern layout, drawings, sketches and contraction, predetermined specifications and the chosen moulding/ casting technique. Split patterns and coreboxes are accurately located, one half to the other by using appropriate dowels or location techniques. Turned patterns are either built up with segments or laminated in such a manner as to reduce timber shrinkage and distortion. Solid patterns, where necessary, are set up on a joint board for ease of moulding, and that the joint line does not develop knife edges of sand, and that all pockets are mouldable. The surface finish is mouldable, tapers are true and straight radii and fillets are true and where necessary, lifting devices are in place. The necessary checking procedures have been carried out.

Assessor guide: confirm that –

The appropriate hand, and hand held power tools and necessary machinery can be identified. The consequences of split patterns turned between centres, not being correctly centred, and the methods of centring can be identified. The reason why that particular type of pattern has been manufactured. Other types of patterns can be identified, and the consequences of using those types. The meaning of mouldable can be identified i.e. surface finish is smooth, tapers are flat, not concave or convex, there are no undercuts, etc. The necessary checking devices have been used and identified. The necessary checking procedures have been carried out.

Criteria 4.10A.3.3

Using acceptable wood pattern making techniques and procedures, pattern component parts are joined or fixed as required and checked for compliance to specification.

Assessor guide: observe that –

The component parts required to manufacture the patterns/corebox are joined/fixed to the main body by using appropriate fixing techniques, eg: glue, nails, screws, dovetails, double round and straight keys, spigot, dowels, butt joints, half lap, spline, etc.

Assessor guide: confirm that –

The various joining and fixing techniques can be identified and the reason why that particular fixing has been used.

Criteria 4.10A.3.4

Pattern correctly marked, colour coded or tagged in compliance with specifications or standard operational procedures.

Assessor guide: observe that –

The completed pattern/corebox has been marked with any necessary identification numbers, colour coded to identify the casting area, core prints, loose pieces, stop off, etc.

Assessor guide: confirm that –

The necessary colour coding can be identified and the consequences of wrong colour code being used.

Range statement

Work undertaken autonomously or in a team environment using predetermined standards of quality, safety and workshop procedures. All specifications interpreted from drawings, technical sketches and/or customer requirements. Tasks undertaken utilise appropriate wood pattern making principles and techniques, designated procedures, correct and appropriate tools and equipment. This unit covers the manufacture of all types of solid, split and turned wood patterns and wood pattern component parts, including but is not limited to general engineering patterns, master patterns with multiple contraction, skeleton, frame and strickle, wheels, pulleys, chain sheaves, impellers etc. Patterns may be constructed by laminating timber and timber composites, stave and lag, box or frame construction or any alternative method that minimises timber shrinkage, warpage and achieves required strength and a full range of timber and timber composites may be used. Solid patterns may be set up on a regular or irregular joint, turned patterns are manufactured using tools and machines appropriate for shaping wood. If patterns are set up on pattern plates see Unit 4.12A (Assemble plated patterns). For the development and manufacture of marine propellers, conveyor screws, cast gears etc. Unit 4.17A (Develop and manufacture gear, conveyor screw and propeller patterns) should also be considered; where precision measurement is required, Unit 12.3A (Precision mechanical measurement) should also be considered. This unit should not be selected when Unit 18.14A (Tool, gauge and die manufacture) has already been selected.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the development and manufacture of wood patterns or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 4.11A A Produce polymer patterns

Band – Specialisation band A

Field – Casting & moulding

Unit Weight 8

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices

7.5A Perform general machining

9.2A Interpret technical drawing

13.3A Work safely with industrial chemicals and materials

18.1A Use hand tools

Element 4.11A.1 Inspect and prepare patterns and cores

Criteria 4.11A.1.1

Patterns or cores inspected for appropriate surface finish and set up on jointline or flat board to specification.

Assessor guide: observe that –

The patterns or cores are sealed with appropriate surface finish and are set up with necessary locations, datums, stripping devices, frames and any special foundry requirements, eg; anticrush, fillets, sand traps, etc. Ensure that datum boards or joint boards are flat and the patterns or cores are securely attached and are flat on the board.

Assessor guide: confirm that –

The consequences of the pattern or core not being surface finished or set up correctly, can be identified.

Criteria 4.11A.1.2

Appropriate parting agent selected and applied to polymer specifications.

Assessor guide: observe that –

The parting agent has been applied evenly and it covers the complete area to be covered with polymer.

Assessor guide: confirm that –

The appropriate parting agent has been used, that other parting agents can be identified and the consequences of using those parting agents.

Element 4.11A.2 Manufacture moulds, patterns, tooling aids etc.

Criteria 4.11A.2.1

Appropriate polymer materials selected to specification.

Assessor guide: observe that –

The appropriate polymer has been selected for that type of pattern, corebox, tooling aid or master mould.

Assessor guide: confirm that –

The complete range of polymers used in the field of pattern making can be identified and the consequences of selecting an inappropriate polymer can be identified.

Criteria 4.11A.2.2

Polymer and hardener mixed to correct ratios and specifications using standard safety and operating procedures.

Assessor guide: observe that –

The polymer and hardener has been mixed thoroughly with minimum air entrapment.

Assessor guide: confirm that –

The correct ratio of polymer to hardener has been used and that any calculations required to determine that ratio have been carried out correctly Identify the consequences of the wrong ratio or incorrect weight measurements being used.

Criteria 4.11A.2.3

Polymer applied to specification and using predetermined methods, ensuring that air is not entrapped in application, excessive heat is not generated and delamination does not occur in final use.

Assessor guide: observe that –

The polymer is applied evenly, that vertical walls are not thinly coated and that no excessive build-up of polymer occurs in pockets. Ensure that air is not trapped while polymer is applied and that the time between applying successive layers is not excessive.

Assessor guide: confirm that –

The reasons for excessive heat generation, air pockets and delamination can be identified and the consequences of those problems explained.

Criteria 4.11A.2.4

Pattern/core box stripped, inspected, cleaned and repaired as required.

Assessor guide: observe that –

The pattern/corebox or tooling aid is stripped using lifting devices to obtain an even lift and in a manner to not damage the equipment. Parting agent has been removed and the equipment has been cleaned. Any repairs have been carried out in a manner to ensure that it has been securely adhered or keyed.

Assessor guide: confirm that –

Various methods of stripping and repairs can be identified.

Criteria 4.11A.2.5

Faces of polymer pattern are machined and finished to specifications.

Assessor guide: observe that –

Those patterns/coreboxes or tooling aids require machining have been machined to drawing/sketches or verbal instruction.

Assessor guide: confirm that –

The various machines used, and their operation can be identified.

Criteria 4.11A.2.6

Appropriate method of location applied to patterns and core boxes.

Assessor guide: observe that –

Where pattern/coreboxes require location, ensure the location is appropriate for that type of equipment and the correct line up has been obtained.

Assessor guide: confirm that –

The various types of location can be identified.

Criteria 4.11A.2.7

Polymer tooling checked for compliance with specifications as required.

Assessor guide: observe that –

The necessary checking procedures have been carried out.

Assessor guide: confirm that –

The measuring devices can be identified. The equipment conforms to drawings/sketches and specifications.

Range statement

Work undertaken autonomously or in a team environment using predetermined standards of quality, safety and workplace procedures. All specifications interpreted from drawings, technical sketches and/or customer requirements. Tasks undertaken utilise appropriate polymer pattern making principles, techniques, designated procedures, correct and appropriate tools, equipment and covers the manufacture of polymer patterns, core boxes, tooling aids, jigs and checking fixtures etc. using various methods of construction including but not limited to solid polymer, sand filled, laminated fibreglass or metal inserts etc.

Evidence guide**Assessment context**

This unit may be assessed on the job, off the job, or a combination of on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the production of polymer patterns or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 4.12A A Assemble plated patterns

Band – Specialisation band A

Field – Casting & moulding

Unit Weight 8

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices

2.13C5 Perform mathematical computations

9.1A Draw and interpret sketch

18.1A Use hand tools

2.7C10 Perform computations - basic

4.10A Develop and manufacture wood patterns

9.2A Interpret technical drawing

18.2A Use power tools/hand held operations

2.8C10 Perform computations

4.18A General woodworking machine operations

12.6A Mark off/out (general engineering)

Element 4.12A.1 Determine job requirements

Criteria 4.12A.1.1

Job instructions and specifications interpreted and understood.

Assessor guide: observe that –

All relevant written instructions, sketches or drawings have been received and used.

Assessor guide: confirm that –

Those instructions, sketches or drawings have been interpreted correctly.

Element 4.12A.2 Inspect and layout patterns

Criteria 4.12A.2.1

Pattern(s) inspected to ensure size and surface finish conforms to specifications, location dowels are tight and pattern halves are correctly aligned.

Assessor guide: observe that –

The surface finish complies to the predetermined moulding process. The tapers are straight and true. The location dowels are tight. There is no mismatch or cross joining.

Assessor guide: confirm that –

The necessary checking devices have been used and the necessary checking procedures have been carried out.

Criteria 4.12A.2.2

Lay out pattern and runner system to specifications from drawings, sketches or verbal instructions.

Assessor guide: observe that –

The patterns and runner systems have been laid out to the predetermined instructions, drawings or sketches.

Assessor guide: confirm that –

The reason for using that particular layout and runner system can be identified. The various types of pattern plates can be identified, eg: cope and drag, double sided, core mould etc.

Element 4.12A.3 Mount pattern on plates**Criteria 4.12A.3.1**

Cope and drag patterns/double sided match plate patterns are attached to pattern plate/s according to specification.

Assessor guide: observe that –

Those patterns mounted on either cope and drag plates, or double sided match plates, are securely attached to the pattern plate or to one another through the pattern plate, by using appropriate screws/fixing techniques.

Assessor guide: confirm that –

The various methods of fixing and drilling techniques can be identified.

Criteria 4.12A.3.2

Cope and drag patterns/double sided match plate patterns are inspected for security and alignment.

Assessor guide: observe that –

The patterns are flat on the plate, located correctly on their location dowels and lined up from cope to drag, in relation to the moulding box pin-centres.

Assessor guide: confirm that –

The techniques for determining cross jointing or mismatch of the pattern and their relationship to the pin-centres can be identified. The consequences if these problems are not identified.

Element 4.12A.4 Mount runner system**Criteria 4.12A.4.1**

Volume of runner system and area of in-gates calculated to conform to specification and manufactured as required.

Assessor guide: observe that –

The runner system has been manufactured to drawings/sketches and specifications.

Assessor guide: confirm that –

The runner system volume and the area of in-gates are correctly calculated to the predetermined specifications.

Criteria 4.12A.4.2

Runner components attached to pattern plates using appropriate fixing and joining techniques to specification.

Assessor guide: observe that –

The runner components have been attached securely to the pattern plate by using appropriate screw/fixing techniques and that any joint/gaps are filled and filleted.

Assessor guide: confirm that –

The consequences of poorly fitted runner system can be identified.

Element 4.12A.5 Inspect plated pattern assembly**Criteria 4.12A.5.1**

Surface and mouldability of plated pattern assembly inspected for compliance with specifications.

Assessor guide: observe that –

Both the pattern and the runner system complies to the predetermined pattern plate layout. The surface finish on both patterns and runners are mouldable. The pattern plates have the necessary pins or bushes and any other necessary pattern plate fixing holes required to suit the predetermined moulding/casting process.

Assessor guide: confirm that –

The various types of pattern plates can be identified. The meaning of mouldable can be identified, i.e. surface finish is smooth, tapered faces are flat, not convex or concave, there are no undercuts, etc.

Range statement

Work undertaken autonomously or in a team environment using predetermined standards of quality, safety and workshop procedures. All specifications interpreted from drawings, technical sketches and/or customer requirements. Tasks undertaken utilise appropriate pattern making principles and techniques, designated procedures, correct and appropriate tools and equipment and covers the manufacture of all types of plated patterns utilising a range of materials such as, timber, timber composite and metal. It covers the manufacture (when appropriate) and mounting of runner systems. This unit does not address machining competencies if these are required appropriate units should also be accessed. For cast aluminium plates see Unit 4.14A (Develop and manufacture production patterns). Where the manufacture of polymer plated patterns is required Unit 4.11A (Produce polymer patterns) should also be accessed. Where precision measurement is required, Unit 12.3A (Precision mechanical measurement) should also be considered.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the assembly of plated patterns or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 4.13A A Develop and manufacture polystyrene patterns

Band – Specialisation band A

Field – Casting & moulding

Unit Weight 2

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices

2.13C5 Perform mathematical computations

9.1A Draw and interpret sketch

18.1A Use hand tools

2.7C10 Perform computations - basic

4.10A Develop and manufacture wood patterns

9.2A Interpret technical drawing

18.2A Use power tools/hand held operations

2.8C10 Perform computations

4.18A General woodworking machine operations

12.6A Mark off/out (general engineering)

Element 4.13A.1 Determine job requirements

Criteria 4.13A.1.1

Drawings, instructions and specifications interpreted and understood.

Assessor guide: observe that –

All relevant written instructions, sketches or drawings have been received and used.

Assessor guide: confirm that –

Those instructions, sketches or drawings have been interpreted correctly.

Criteria 4.13A.1.2

Appropriate grade/type of polystyrene selected to meet specifications.

Assessor guide: observe that –

The polystyrene selected is appropriate for that type of pattern or foundry process.

Assessor guide: confirm that –

The various types of polystyrene can be identified.

Element 4.13A.2 Mark out pattern

Criteria 4.13A.2.1

Perform appropriate calculations to determine contraction allowance etc.

Assessor guide: observe that –

Those calculations necessary for the pattern manufacture have been carried out, eg: contraction etc.

Assessor guide: confirm that –

The calculus necessary to perform those calculations can be identified.

Criteria 4.13A.2.2

Mark out pattern/pattern components to meet specifications.

Assessor guide: observe that –

The polystyrene has been marked out to meet the pattern and pattern component manufacturing requirements and conforms to specifications.

Assessor guide: confirm that –

The marking out tools and devices can be identified. The reason why taper or cores are not required, can be identified.

Element 4.13A.3 Manufacture pattern**Criteria 4.13A.3.1**

Pattern components are correctly jointed and secured using appropriate adhesives.

Assessor guide: observe that –

The type of adhesive used is correct for the job. The method of joining and securing the various component parts.

Assessor guide: confirm that –

The various types of adhesive can be identified and the consequences of the wrong adhesive being used.

Criteria 4.13A.3.2

Appropriate tools selected and techniques used to manufacture polystyrene patterns to specification.

Assessor guide: observe that –

The tools selected to shape and manufacture the patterns are appropriate.

Assessor guide: confirm that –

All the various tools used in the manufacture of polystyrene patterns can be identified.

Criteria 4.13A.3.3

Pattern is checked for compliance with specifications and correctly marked for identification.

Assessor guide: observe that –

The completed pattern has been checked using the necessary checking procedure and checking devices to determine that the pattern conforms to specifications. The pattern has been marked for identification.

Assessor guide: confirm that –

The checking procedure and checking devices can be identified.

Element 4.13A.4 Protect pattern from damage**Criteria 4.13A.4.1**

Patterns are handled and stored in a safe manner least likely to cause damage using standard operating procedures.

Assessor guide: observe that –

Care has been taken in handling and storing the completed pattern.

Assessor guide: confirm that –

The consequences of rough handling and incorrect storage can be identified.

Range statement

This unit covers all patterns using polystyrene, including patterns for the Lost Foam Process and for those areas on a wood pattern and core box where polystyrene is required. Work undertaken autonomously or in a team environment using predetermined standards of quality, safety and workshop procedures. All specifications interpreted from drawings, technical sketches and/or customer requirements. Where holes are required in the final casting they are built into the pattern as specified. Allowances are made for contraction and machining. Where precision measurement is required, Unit 12.3A (Precision mechanical measurement) should also be considered.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the development and manufacture of polystyrene patterns or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 4.14A A Develop and manufacture production patterns

Band – Specialisation band A

Field – Casting & moulding

Unit Weight 8

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices
 2.13C5 Perform mathematical computations
 4.18A General woodworking machine operations
 9.2A Interpret technical drawing
 18.2A Use power tools/hand held operations

2.7C10 Perform computations - basic
 4.10A Develop and manufacture wood patterns
 7.5A Perform general machining
 12.6A Mark off/out (general engineering)

2.8C10 Perform computations
 4.12A Assemble plated patterns
 9.1A Draw and interpret sketch
 18.1A Use hand tools

Element 4.14A.1 Determine job requirements

Criteria 4.14A.1.1

Drawings, instructions and specifications interpreted and understood.

Assessor guide: observe that –

All relevant written instructions, sketches, drawings or sample components have been received and used.

Assessor guide: confirm that –

Those instructions, sketches or drawings have been interpreted correctly.

Criteria 4.14A.1.2

Pattern type and design conceptualised and planned with reference to customer's specification (written or verbal) for number, layout, runner system and core box design.

Assessor guide: observe that –

The number of patterns, pattern layout, runner system and core box design, have been planned with reference to customer requirements and the predetermined moulding/casting process.

Assessor guide: confirm that –

The predetermined moulding/casting and core making process can be identified.

Criteria 4.14A.1.3

Pattern design is interpreted and visualised from drawings, prints or plans and checked against customer requirements.

Assessor guide: observe that –

Where metal patterns and coreboxes are fully machined without the use of pattern aids, i.e CAD/CNC. That the pattern equipment has been visualised and interpreted correctly from drawings, customer instructions and foundry requirements.

Assessor guide: confirm that –

The programming and machining process/processes, can be identified.

Criteria 4.14A.1.4

Plan developed for sequence of manufacture for either a high or low volume foundry production pattern.

Assessor guide: observe that –

A planned sequence of manufacture has been developed for high volume tooling, eg: pre-matching, datum tooling holes pantographing, copy mill, handwork, finish machining, venting, etc. A planned sequence of manufacture has been developed for low volume tooling, eg: joint line either sanded or milled, dowelled, handwork, etc.

Assessor guide: confirm that –

The developed sequence of manufacture can be identified for both higher and low volume tooling, and the consequences of not following that developed sequence of manufacture can be identified.

Element 4.14A.2 Develop pattern equipment**Criteria 4.14A.2.1**

Appropriate materials selected and obtained to meet requirements of strength, durability and component finish etc.

Assessor guide: observe that –

The materials selected meet with the requirements for the predetermined moulding/casting process for strength, durability and surface finish.

Assessor guide: confirm that –

The various materials used for the manufacture of metal patterns and core boxes, can be identified and the reason for their use.

Criteria 4.14A.2.2

Calculations appropriate to establishing pattern parameters are performed, including angles, tapers, contraction, etc. where applicable.

Assessor guide: observe that –

Those calculations necessary to establish contraction tapers, clearances etc., have been carried out.

Assessor guide: confirm that –

The calculus necessary to perform those calculations are understood.

Element 4.14A.3 Perform machining operations**Criteria 4.14A.3.1**

Appropriate machines and machining process selected to shape/produce production patterns and core boxes to specification.

Assessor guide: observe that –

The range of machine tools selected is appropriate for the manufacture of the equipment to size and specifications, i.e. mills, pantographs, copymill, lathe etc.

Assessor guide: confirm that –

The range of machine tools and their operation can be identified.

Element 4.14A.4 Use hand and hand held power tools**Criteria 4.14A.4.1**

A range of hand and hand held power tools are selected to fashion/manufacture production patterns and core boxes to specification.

Assessor guide: observe that –

The range of hand and hand held power tools is appropriate for the manufacture of the equipment to size and specification.

Assessor guide: confirm that –

The range of hand and hand held power tools and their correct use, identified.

Criteria 4.14A.4.2

Production patterns and core boxes checked to specification and surface finish checked for mouldability.

Assessor guide: observe that –

The pattern/core box equipment has been checked using the necessary checking procedures and the necessary checking devices to determine that the equipment conforms to drawings/sketches, specifications and the predetermined moulding/casting process. The surface finish is suitable for sand moulding and that all tapers, fillets and radii are true and mouldable.

Assessor guide: confirm that –

The necessary checking procedures and checking devices can be identified. The hand work has been carried out accurately without the loss of size or shape. The consequences of inaccurate and poorly finished hand work can be identified. The meaning of mouldable can be identified, i.e. surface finish is smooth, tapered faces are flat, not concave or convex, there are no undercuts.

Range statement

Work undertaken autonomously or in a team environment using predetermined standards of quality, safety and workshop procedures. All specifications interpreted from drawings, technical sketches and/or customer requirements. Tasks undertaken utilise appropriate pattern making principles and techniques, designated procedures, correct and appropriate tools and equipment and covers the manufacture of all types of metal patterns, core boxes and associated equipment including cast plates etc. Patterns may be loose, integral with the plate or mounted to the plates with gating, depending upon specifications production core boxes also may be loose or mounted into core box rigs etc, depending upon specifications. Patterns and core boxes are manufactured from a range of ferrous, non-ferrous and alloy materials using conventional metal cutting machines, including pantograph and copy mills etc. Patterns and core boxes are finished using appropriate hand working equipment. Where the manufacture of polymer production patterns is required, Unit 4.11A (Produce polymer patterns) should be considered. Where precision measurement is required, Unit 12.3A (Precision mechanical measurement) should also be considered.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the development and manufacture of production patterns or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 4.15A A Develop and manufacture vacuum forming moulds and associated equipment

Band – Specialisation band A

Field – Casting & moulding

Unit Weight 6

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices
 2.13C5 Perform mathematical computations
 4.12A Assemble plated patterns
 7.5A Perform general machining
 12.6A Mark off/out (general engineering)
 18.2A Use power tools/hand held operations

2.7C10 Perform computations - basic
 4.10A Develop and manufacture wood patterns
 4.14A Develop and manufacture production patterns
 9.1A Draw and interpret sketch
 13.3A Work safely with industrial chemicals and materials

2.8C10 Perform computations
 4.11A Produce polymer patterns
 4.18A General woodworking machine operations
 9.2A Interpret technical drawing
 18.1A Use hand tools

Element 4.15A.1 Determine job requirements

Criteria 4.15A.1.1

Drawings, instructions and specifications interpreted and understood.

Assessor guide: observe that –

All relevant written instructions, sketches or drawings have been received and used.

Assessor guide: confirm that –

Those instructions or drawings have been interpreted correctly.

Criteria 4.15A.1.2

Vacuum forming processes are applied to determine the design of vacuum forming moulds and associated equipment to be constructed.

Assessor guide: observe that –

The type of vacuum forming moulds and associated equipment will meet requirements for the predetermined vacuum forming process.

Assessor guide: confirm that –

The various types of vacuum forming processes can be identified. The equipment to suit those processes can be identified.

Criteria 4.15A.1.3

Appropriate material selected to meet specifications.

Assessor guide: observe that –

The material selected for that particular vacuum forming process is suitable and will meet customer requirements.

Assessor guide: confirm that –

The various materials used in vacuum forming processes can be identified. The consequences of using incorrect materials, identified.

Element 4.15A.2 Develop/mark out vacuum forming equipment**Criteria 4.15A.2.1**

Perform appropriate calculations to establish the equipment parameters, taking into account plastic sheet thickness and shrinkage etc.

Assessor guide: observe that –

The calculations necessary for the manufacturing of that particular vacuum form equipment have been carried out, and that the shrinkage and plastic sheet thickness has been taken into account.

Assessor guide: confirm that –

The calculus necessary to carry out those calculations can be identified.

Criteria 4.15A.2.2

Mark out vacuum forming equipment showing size and position of air evacuation and of the moulded form.

Assessor guide: observe that –

The predetermined die design and vacuum forming process has been marked out, laid out, including size and position of air evacuation holes.

Assessor guide: confirm that –

The reasons for the importance of the position and size of the air evacuation holes can be identified.

Element 4.15A.3 Manufacture vacuum forming equipment**Criteria 4.15A.3.1**

Appropriate machines and machining process selected to shape/produce vacuum forming equipment to specification.

Assessor guide: observe that –

The vacuum forming equipment has been manufactured using a range of machine tools appropriate for shaping/sizing, to specification.

Assessor guide: confirm that –

Arrange of machine tools and their operation can be identified.

Criteria 4.15A.3.2

A range of hand and hand held power tools are selected and used to fashion/manufacture vacuum forming equipment to specification.

Assessor guide: observe that –

The vacuum forming equipment has been surface finished using various hand held power tools.

Assessor guide: confirm that –

The various hand and hand held power tools and their correct use, can be identified, and used, using normal safety standards.

Criteria 4.15A.3.3

Constructed vacuum forming equipment checked to specification.

Assessor guide: observe that –

The complete vacuum forming equipment complies with the predetermined vacuum forming process, and customer specifications.

Assessor guide: confirm that –

The necessary checking devices have been used and can be identified. The necessary checking procedures have been carried out. The surface finish meets requirements.

Range statement

Work undertaken autonomously or in a team environment using predetermined standards of quality, safety and workshop procedures. All specifications interpreted from drawings, technical sketches and/or customer requirements. Tasks undertaken utilise appropriate pattern making principles and techniques, designated procedures, correct and appropriate tools and equipment and cover the manufacture of all types of vacuum forming equipment including vacuum bagging, utilising a range of materials such as, timber, composites, polymer, metal etc. Where precision measurement is required, Unit 12.3A (Precision mechanical measurement) should also be considered.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the development and manufacture of vacuum forming moulds and associated equipment or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 4.16A B Develop and manufacture precision models

Band – Specialisation band A

Field – Casting & moulding

Unit Weight 6

This unit covers the competencies required for laying out and manufacturing and finishing precision models. Appropriate tools and techniques are used to manufacture models such as flow models, viewing models, prototype and development models using a wide range of materials (for example timber, metal plastic, fibreglass composites) and processes.

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices
 2.13C5 Perform mathematical computations
 4.12A Assemble plated patterns
 4.15A Develop and manufacture vacuum forming moulds and associated equipment
 9.1A Draw and interpret sketch
 12.6A Mark off/out (general engineering)
 18.2A Use power tools/hand held operations

2.7C10 Perform computations - basic
 4.10A Develop and manufacture wood patterns
 4.13A Develop and manufacture polystyrene patterns
 4.18A General woodworking machine operations
 9.2A Interpret technical drawing
 13.3A Work safely with industrial chemicals and materials

2.8C10 Perform computations
 4.11A Produce polymer patterns
 4.14A Develop and manufacture production patterns
 7.5A Perform general machining
 12.3A Precision mechanical measurement
 18.1A Use hand tools

Element 4.16A.1 Determine job requirements

Criteria 4.16A.1.1

Drawings, instructions and specifications interpreted and understood

Assessor guide: observe that –

All relevant written instructions, drawings have been received and used

Assessor guide: confirm that –

Those instructions, drawings etc. have been interpreted correctly

Criteria 4.16A.1.2

Appropriate material selected to meet specifications

Assessor guide: observe that –

The materials have been selected for ease of working, stability and can be worked accurately

Assessor guide: confirm that –

The consequences of selecting inappropriate materials can be identified

Element 4.16A.2 Layout model

Criteria 4.16A.2.1

Finished model design conceptualised and planned with reference to customer's specifications (written or verbal) for finish, quality and form known processes

Assessor guide: observe that –

The type of model has been visualised and determined by using the instructions, drawings and the knowledge of the predetermined process i.e. high volume foundry tooling, injection moulding, pressure die casting etc.

Assessor guide: confirm that –

The various processes requiring models, can be identified

Criteria 4.16A.2.2

Calculate contractions allowances, clearances, tapers etc. to establish model parameters

Assessor guide: observe that –

The calculations necessary for manufacture have been carried out

Assessor guide: confirm that –

The calculus necessary to carry out calculations can be identified

Criteria 4.16A.2.3

Design and manufacture datum boards, jigs and fixtures as required

Assessor guide: observe that –

All necessary datum boards, datum holes or datum faces etc. required for accurate manufacture, have been developed and manufactured Any jigs and fixtures required for manufacture have been developed and manufactured

Assessor guide: confirm that –

The reason why datum boards, datum holes or datum faces are required for manufacture and their use identified The reason why those particular manufacturing aids are required and their use identified

Element 4.16A.3 Manufacture model**Criteria 4.16A.3.1**

Determine sequence of manufacture, including build-up on datum board, establishing datum's mark out of model and areas to be NC/CNC machined

Assessor guide: observe that –

A planned sequence of manufacture has been developed eg: model built upon datum boards, datums developed, areas required to be accurately manufactured by NC/CNC have been identified, etc.

Assessor guide: confirm that –

The developed sequence of manufacture can be identified The consequence of not following that developed sequence of manufacture, can be identified

Criteria 4.16A.3.2

Appropriate machines and machining process selected to shape/produce model to specifications

Assessor guide: observe that –

The range of machines and machining processes selected is appropriate for manufacturing the model accurately to size, tolerance and specifications

Assessor guide: confirm that –

The range of machines and machining processes and their operations can be identified

Criteria 4.16A.3.3

A range of hand and hand held power tools are selected and used utilising acceptable techniques and procedures to fashion/manufacture model to fine tolerances according to specifications, ensuring that surface finish is appropriate to the type of model

Assessor guide: observe that –

The range of hand and hand held power tools is appropriate for the manufacture of the model, accurately, to size, tolerance and specifications The surface finish is appropriate

Assessor guide: confirm that –

The range of hand and hand held power tools, and their correct use, can be identified

Criteria 4.16A.3.4

Appropriate measurement/calculations undertaken to check specifications, including coordinate measuring, machine checking as required

Assessor guide: observe that –

The necessary checking procedures have been carried out The checking devices are appropriate for checking to the predetermined accuracy and fine tolerances

Assessor guide: confirm that –

The various checking procedures, can be identified The necessary checking devices, including CMM, can be identified

Criteria 4.16A.3.5

Where necessary, all deviations or modifications to original tooling design, prints or plans, recorded and reported consistent with standard operating procedure

Assessor guide: observe that –

Assessor guide: confirm that –

Any deviation or modification to original drawings or specifications has been recorded

Range statement

Work undertaken autonomously or in a team environment using predetermined standards of quality, safety and workshop procedures. All specifications interpreted from complex drawings and Mylar drawings, technical sketches and/or customer requirements. Tasks undertaken utilise appropriate model making principles and techniques, designated procedures, correct and appropriate tools and equipment and cover the development and manufacture of flow models, viewing models, prototype and development models and the inspection and completion of items made in the stereo lithography process etc. Utilising a wide variety of materials including but not limited to timber, metal, plastic, fibreglass, composites etc. and where accurate and complicated models are required to assist in the development and manufacture of production of tooling for a wide variety of processes, such as, blow moulding, metal forming, vacuum forming, rotational moulding, gravity die casting, pressure die casting, low pressure die casting, complex ferrous and non-ferrous castings, plastic injection moulding, etc. When the programming of coordinate measurement machines and/or NC/CNC machines are required see appropriate machine

Evidence guide**Assessment context**

This unit may be assessed on the job, off the job, or a combination of on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the development and manufacture precision models or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 4.17A A Develop and manufacture gear, conveyor screw and propeller patterns

Band – Specialisation band A

Field – Casting & moulding

Unit Weight 4

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices

2.13C5 Perform mathematical computations

4.18A General woodworking machine operations

12.6A Mark off/out (general engineering)

2.7C10 Perform computations - basic

4.10A Develop and manufacture wood patterns

9.1A Draw and interpret sketch

18.1A Use hand tools

2.8C10 Perform computations

4.12A Assemble plated patterns

9.2A Interpret technical drawing

18.2A Use power tools/hand held operations

Element 4.17A.1 Determine job requirements

Criteria 4.17A.1.1

Drawings, instructions and specifications interpreted and understood.

Assessor guide: observe that –

All relevant written instructions, sketches or drawings have been received and used.

Assessor guide: confirm that –

Those instructions, sketches or drawings have been interpreted correctly.

Criteria 4.17A.1.2

Appropriate material selected to meet specifications.

Assessor guide: observe that –

The appropriate materials have been selected for ease of working, stability, durability and strength to suit the predetermined moulding/casting techniques and foundry process.

Assessor guide: confirm that –

The consequences of selecting inappropriate materials can be identified.

Criteria 4.17A.1.3

Moulding, cast techniques and foundry processes are applied in determining the type of pattern required.

Assessor guide: observe that –

The type of pattern will meet the requirements for the predetermined moulding/casting technique and foundry process.

Assessor guide: confirm that –

The reason why that particular type of pattern is to be manufactured, and other types can be identified and the consequence of using those types. The predetermined mould/casting technique and foundry process can be identified.

Element 4.17A.2 Layout pattern**Criteria 4.17A.2.1**

Calculate pattern parameters such as pitch circles, pressure angles, tooth form, left and right hand flight helix, pitch axial dimensions, angles, tapers, clearances, contraction allowances etc. appropriate to developing various types of gear, conveyor and propeller forms etc.

Assessor guide: observe that –

The calculations necessary for the development and manufacture of either cast gears, conveyor screws or marine propellers, have been carried out.

Assessor guide: confirm that –

The calculus necessary to carry out those calculations can be identified.

Criteria 4.17A.2.2

Layout pattern showing tapers, machining allowances, core prints and method of construction etc. to specification.

Assessor guide: observe that –

The pattern has been laid out fully and conforms to drawings, sketches, predetermined specifications and tolerances, etc.

Assessor guide: confirm that –

The consequences of not laying out the pattern in detail, and with all known specifications, can be identified.

Criteria 4.17A.2.3

Develop and manufacture jigs and fixtures to aid the manufacture of the pattern form as required.

Assessor guide: observe that –

Any jigs and fixtures required for manufacture have been developed and manufactured.

Assessor guide: confirm that –

The reasons why those particular manufacturing aids are required, and they can be identified.

Element 4.17A.3 Manufacture pattern**Criteria 4.17A.3.1**

Materials marked out and construction developed to meet specifications.

Assessor guide: observe that –

The material has been marked out to suit the development/construction of cast gears, conveyor screws or marine propellers.

Assessor guide: confirm that –

The process of developing gears, screws and propellers can be identified.

Criteria 4.17A.3.2

Using acceptable wood pattern making techniques, procedures and utilising appropriate hand and hand held power tools, pattern or pattern component parts are produced to size and shape and checked for compliance with specifications.

Assessor guide: observe that –

The completed pattern complies with the pattern layout, drawings, sketches, predetermined specifications and the chosen moulding/casting technique. The surface finish is mouldable, tapers are true and straight, radii and fillets are true and where necessary, lifting devices are in place.

Assessor guide: confirm that –

The appropriate hand and hand held tools and necessary machinery can be identified. The necessary checking devices can be identified. The various checking procedures can be identified. The meaning of mouldable can be identified, i.e. surface finish is smooth, tapered faces are flat, not concave or convex, there are no undercuts.

Criteria 4.17A.3.3

Using acceptable pattern making techniques and procedures, pattern component parts are joined or fixed as required, according to specifications.

Assessor guide: observe that –

The component parts required to manufacture the pattern are jointed/fixed to the main body by using appropriate fixing techniques, eg: glue, nails, screws, dovetails, double round and straight keys, spigots, dowels, butt joints, half lap, spline, etc.

Assessor guide: confirm that –

The various jointing techniques can be identified and the reason why that particular fixing was used.

Criteria 4.17A.3.4

Pattern correctly marked, colour coded and/or tagged in compliance with specifications or standard operating procedure.

Assessor guide: observe that –

The completed pattern has been marked with any necessary identification numbers, colour coded to identify casting area, core prints, loose pieces etc.

Assessor guide: confirm that –

The necessary colour coding can be identified and the consequences of the wrong coding being used.

Range statement

Work undertaken autonomously or in a team environment using predetermined standards of quality, safety and workshop procedures. All specifications interpreted from drawings, technical sketches and/or customer requirements. Tasks undertaken utilise appropriate wood pattern making principles and techniques, designated procedures, calculations, appropriate tools, equipment and cover the development and manufacture of patterns for all types of cast gears, conveyor screws, marine propellers etc. utilising the full range of timbers and composites. Gear patterns may be segmented or any other method to minimise timber shrinkage or warpage and to achieve the required strength. Conveyor and marine screws may be built up using predetermined thickened timber, either over a mandrel or a layout. Patterns may be set up on a joint board or plated for ease of moulding. Where precision measurement is required, Unit 12.3A (Precision mechanical measurement) should also be considered.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the development and manufacture gear, conveyor screw and propeller patterns or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 4.18A A General woodworking machine operations

Band – Specialisation band A

Field – Casting & moulding

Unit Weight 4

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices

9.1A Draw and interpret sketch

9.2A Interpret technical drawing

18.1A Use hand tools

Element 4.18A.1 Determine job requirements

Criteria 4.18A.1.1

Job instructions and specifications interpreted and understood.

Assessor guide: observe that –

Any written instructions or sketches have been received and used.

Assessor guide: confirm that –

Those instructions or sketches have been interpreted correctly.

Criteria 4.18A.1.2

Appropriate woodworking machine selected to meet specifications.

Assessor guide: observe that –

The machine selected is appropriate for that machining operation.

Assessor guide: confirm that –

The range of woodworking machines and their operations can be identified.

Element 4.18A.2 Set up woodworking machine

Criteria 4.18A.2.1

Tools/cutters are selected where appropriate.

Assessor guide: observe that –

The tools/cutters selected are appropriate for that operation.

Assessor guide: confirm that –

The range of tools/cutters for different purposes can be identified.

Criteria 4.18A.2.2

Cutting tools are sharpened and/or shaped to meet specifications.

Assessor guide: observe that –

The cutter/cutter blades etc. have been sharpened or shaped to the correct set or cutting angles.

Assessor guide: confirm that –

The consequences of incorrect set or cutting angles can be identified.

Criteria 4.18A.2.3

Tools/cutters are correctly installed using standard operating procedures.

Assessor guide: observe that –

The tool holder, tools, and cutters etc., are held in by using the correct bolting/attachments, to suit the machine.

Assessor guide: confirm that –

The consequences of tool holders, tools and cutters etc., being incorrectly secured, can be identified.

Criteria 4.18A.2.4

Appropriate guards/stops are set and adjusted as required.

Assessor guide: observe that –

Guards and stops have been set correctly.

Assessor guide: confirm that –

The consequences of not using guards etc., can be identified.

Element 4.18A.3 Operate woodworking machines**Criteria 4.18A.3.1**

Material to be machined is positioned and secured.

Assessor guide: observe that –

The material has been positioned correctly on the machine and that it has been securely clamped and that the clamps will not interfere with the machining operations.

Assessor guide: confirm that –

The various methods and manner of clamping can be identified.

Criteria 4.18A.3.2

Woodworking machine is operated to cut materials to specification using standard operating procedures.

Assessor guide: observe that –

The machines used either to machine the material in a clamped position, e.g. pattern mills, or while the material is held by hand eg: buzzers, sanders, routers, etc. or while the cutting tool is being held by hand, e.g. lathe, are correctly operated, using all necessary safety measures.

Assessor guide: confirm that –

The operation of various woodworking machines can be identified. Various safety problems can be identified eg: material too short, direction of the grain, fingers are well clear of cutter, etc.

Criteria 4.18A.3.3

Material is used in most economical way.

Assessor guide: observe that –

Assessor guide: confirm that –

The various methods of using the material in the most economical way can be identified.

Element 4.18A.4 Check finished component**Criteria 4.18A.4.1**

Machined component checked against specifications and predetermined finish.

Assessor guide: observe that –

The finished component is checked for size against specifications. The finished machine surface is acceptable.

Assessor guide: confirm that –

The necessary checking procedures have been carried out. The reason for a poorly finished surface, can be identified.

Range statement

Work undertaken autonomously or in a team environment using predetermined standards of quality, safety and workshop procedures. This unit covers all woodworking machines used by Engineering Patternmakers and involves the use of various machines including but not limited to, band saws, buzzers, thicknesser, disk sander, bobbin sander, pattern mill, wood lathe, pedestal router and drill etc. and covers the sharpening of blades and cutters. This unit is not appropriate for those using specialised woodworking machines etc. (Cabinet makers etc.) For hand held/power tools use Unit 18.2A (Use power tools/hand held operations).

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the general wood working machine operations or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 4.19A A Refractory installation and repair

Band – Specialisation band A

Field – Casting & moulding

Unit Weight 4

Pre-requisite units - Path 1

18.1A Use hand tools

18.2A Use power tools/hand held operations

Element 4.19A.1 Inspect refractory

Criteria 4.19A.1.1

Specification interpreted and understood.

Assessor guide: observe that –

All relevant instruction and specifications are obtained in accordance with workplace procedures.

Assessor guide: confirm that –

Instructions and specifications can be correctly interpreted and understood.

Criteria 4.19A.1.2

Specific areas of the refractory identified for repair or replacement.

Assessor guide: observe that –

The refractory inspected and faults identified for repair or replacement in accordance with standard operating procedures.

Assessor guide: confirm that –

Indicators of need for replacement can be described.

Element 4.19A.2 Knockout refractory

Criteria 4.19A.2.1

Sequence of operations to remove refractory is determined to meet the job specification.

Assessor guide: observe that –

A work plan is prepared identifying the sequence for refractory removal in accordance with standard operating procedures.

Assessor guide: confirm that –

Work plan can be prepared for a variety of situations.

Criteria 4.19A.2.2

Appropriate tools and equipment selected to safely remove damaged refractory.

Assessor guide: observe that –

Appropriate tools and equipment selected in accordance with workplace procedures.

Assessor guide: confirm that –

Tools and equipment appropriate for the job can be identified.

Criteria 4.19A.2.3

Damaged refractory is removed and disposed of safely.

Assessor guide: observe that –

The damaged refractory is safely removed and disposed of in accordance with standard operating procedures.

Assessor guide: confirm that –

There is an awareness of OHS issues.

Element 4.19A.3 Prepare refractory materials**Criteria 4.19A.3.1**

Appropriate refractory materials selected to meet specifications.

Assessor guide: observe that –

The appropriate refractory materials selected to meet specifications accordance with standard operating procedures.

Assessor guide: confirm that –

Different refractory materials can be identified.

Criteria 4.19A.3.2

Refractory media is mixed to specification.

Assessor guide: observe that –

The refractory media is mixed to in accordance with standard operating procedures.

Assessor guide: confirm that –

The impact of incorrect mixing ratios and methods is understood.

Element 4.19A.4 Install refractory**Criteria 4.19A.4.1**

Sequence of operations to install refractory is determined to meet the job specification.

Assessor guide: observe that –

A work plan is prepared identifying the sequence for installing refractory in accordance with standard operating procedures.

Assessor guide: confirm that –

Work plan can be prepared for a variety of situations.

Criteria 4.19A.4.2

Refractory is installed using appropriate techniques and tools and equipment to meet the job specification.

Assessor guide: observe that –

The refractory is installed to the correct wall thickness and surface finish in accordance with standard operating procedures.

Assessor guide: confirm that –

The effect of incorrect wall thickness and/or surface finish is understood.

Element 4.19A.5 Cure refractory**Criteria 4.19A.5.1**

Refractory cured to specifications using appropriate techniques and equipment to meet the job specification.

Assessor guide: observe that –

The refractory is cured to specifications using appropriate techniques and equipment selected in accordance with standard operating procedures.

Assessor guide: confirm that –

The importance of any specified curing is understood.

Range statement

This unit covers the repairs and replacement of all types of refractory, including relining furnaces, treatment vessels, ladles and launders, and covers material which can be machine rammed, hand rammed, forked or vibrated. This includes refractory bricks and their replacement. Work is carried out autonomously or in a team to predetermined standards of quality and safety. For operational maintenance such as routine repair/repointing of refractory see Units 4.1A (Operate melting furnace) and/or Unit 4.7A (Pour molten metal).

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with furnace/kiln operations, or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 5.1A A Manual soldering/desoldering - electrical/electronic components

Band – Specialisation band A

Field – Fabrication

Unit Weight 4

Element 5.1A.1 Prepare materials for soldering

Criteria 5.1A.1.1

Materials preparation instructions understood and followed.

Assessor guide: observe that –

Materials are prepared for soldering in accordance with instructions and work site procedures.

Assessor guide: confirm that –

The preparation requirements of materials prior to soldering can be identified. The consequences of incorrect material preparation prior to soldering can be given.

Criteria 5.1A.1.2

Materials prepared using correct soldering tools, equipment, materials and procedures.

Assessor guide: observe that –

Appropriate tools are used in the preparation of materials for soldering in accordance with work site procedures.

Assessor guide: confirm that –

The correct application of a range of soldering tools and equipment can be given. The applications of different solders and fluxes with respect to the materials to be soldered can be identified.

Criteria 5.1A.1.3

Materials prepared to specifications using instruction or standard operating procedures.

Assessor guide: observe that –

The materials to be soldered are prepared to specification and in accordance with work site procedures.

Assessor guide: confirm that –

The material preparation requirements can be identified.

Element 5.1A.2 Solder materials

Criteria 5.1A.2.1

Correct soldering techniques, procedures, materials and soldering tools selected.

Assessor guide: observe that –

An appropriate soldering technique is selected in accordance with work site procedures. The correct tools and materials are selected in accordance with work site procedures.

Assessor guide: confirm that –

Examples of alternative soldering techniques and their application can be given.

<p>Criteria 5.1A.2.2 Materials to be jointed, mounted, shaped to specification using standard operating procedures.</p>	<p><i>Assessor guide: observe that –</i> Where appropriate, materials to be jointed are aligned, clamped and mounted as necessary prior to soldering, in accordance with work site procedures.</p>	<p><i>Assessor guide: confirm that –</i> The required relationship between the parts to be joined can be identified.</p>
<p>Criteria 5.1A.2.3 Solder applied using correct and appropriate techniques.</p>	<p><i>Assessor guide: observe that –</i> An appropriate soldering technique is used to apply solder to the materials to be jointed, in accordance with work site procedures.</p>	<p><i>Assessor guide: confirm that –</i></p>
<p>Criteria 5.1A.2.4 Where appropriate, excess material removed using correct and appropriate tools and techniques.</p>	<p><i>Assessor guide: observe that –</i> Where appropriate, excess solder is removed in accordance with work site procedures.</p>	<p><i>Assessor guide: confirm that –</i> Methods of solder removal and their application can be identified.</p>
<p>Criteria 5.1A.2.5 Procedures for the protection of components observed according to standard operating procedure.</p>	<p><i>Assessor guide: observe that –</i> Work site procedures for the protection of components are followed.</p>	<p><i>Assessor guide: confirm that –</i> Component protection procedures can be described.</p>
<p>Element 5.1A.3 Inspect solder joints</p>		
<p>Criteria 5.1A.3.1 Inspection procedure undertaken to standard operating procedures.</p>	<p><i>Assessor guide: observe that –</i> Work site inspection procedures are followed.</p>	<p><i>Assessor guide: confirm that –</i> The inspection procedures for soldered joints can be identified.</p>
<p>Criteria 5.1A.3.2 Inspection results reported/recorded to standard operating procedures as required.</p>	<p><i>Assessor guide: observe that –</i> Inspection results are recorded/reported in accordance with work site procedures.</p>	<p><i>Assessor guide: confirm that –</i> The information to be recorded and the frequency of recording can be identified.</p>

Element 5.1A.4 Undertake desoldering**Criteria 5.1A.4.1**

Correct and appropriate techniques, procedures, desoldering tools and equipment selected.

Assessor guide: observe that –

Appropriate desoldering tools and equipment are selected in accordance with work site procedures.

Assessor guide: confirm that –

Desoldering techniques and procedures can be identified. The applications of different desoldering techniques/procedures can be given.

Criteria 5.1A.4.2

Materials/components de-soldered using correct procedure minimising damage to materials, components.

Assessor guide: observe that –

Materials/components are de-soldered in accordance with work site procedures. Damage to materials/components is minimised through the application of appropriate work site procedures.

Assessor guide: confirm that –

Methods of minimising damage to materials/components can be identified.

Criteria 5.1A.4.3

Material/device removed and cleaned to specifications using standard operating procedures.

Assessor guide: observe that –

The material/device is removed and cleaned in accordance with work site procedures.

Assessor guide: confirm that –

The methods of cleaning solder from materials/devices can be identified. The applications of different cleaning methods can be given.

Range statement

This unit covers manual soldering/desoldering for the installation and fabrication of electrical/electronic components. Work undertaken in a production or maintenance environment using predetermined standards of quality, safety and work procedures. Component protection procedures are predetermined. Correct and appropriate soldering tools and equipment may include all types of soldering irons, cutters, brushes, files, soldering tips, solder syringes, holding devices etc. Correct and appropriate materials may include solder (solid resin cord and paste), flux (resin or powder) etc. All materials and procedures specified via job instructions. Inspections carried out using visual, mechanical or electric techniques with pre setup equipment. All work undertaken to legislative and regulatory requirements. Depending on the actual soldering job, hand and power tools and measuring skills may be required. These are covered by other units such as Unit 18.1A (Use hand tools), Unit 18.2A (Use power tools/hand held operations) and appropriate measurement units. Handling refers to methods of physical handling and stress relief methods of preventing damage caused by electrostatic discharge. This may include wrist straps and anti-static work areas and practices. This unit does not include skills in silver soldering or brazing skills. These skills are covered in Unit 5.6A (Perform brazing and/or silver soldering). Where soldering and desoldering is limited to the straightforward termination, disconnection or reconnection of electrical wiring then see Unit 10.2A (Terminate and connect electrical wiring). Advanced specification and high reliability soldering associated with the installation of electrical/electronic components, in areas where reliability of connections is critical, is covered by Unit 5.2A (High reliability soldering and desoldering).

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with manual soldering and desoldering or other competencies requiring the exercise of the skills and knowledge covered by this unit.

Assessment conditions

The candidate will be provided with: - All tools, equipment, material and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment, the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specifications; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities.

Unit MEM 5.2A A High reliability soldering and desoldering

Band – Specialisation band A

Field – Fabrication

Unit Weight 4

Pre-requisite units - Path 1

5.1A Manual soldering/desoldering - electrical/electronic components

Element 5.2A.1 Determine job requirements

Criteria 5.2A.1.1

Job specification determined using data sheets, specifications, technical drawings or via consultation with technical experts.

Assessor guide: observe that –
All relevant data sheets, specifications, instructions and technical drawings are obtained in accordance with workplace procedures. Where appropriate, technical experts are consulted as to the job specifications.

Assessor guide: confirm that –
The work to be undertaken can be identified. The specifications pertaining to the work to be done can be identified.

Criteria 5.2A.1.2

Correct and appropriate tools, equipment and material selected.

Assessor guide: observe that –

Assessor guide: confirm that –
The appropriate tools, equipment and materials to carry out the work can be identified. The reasons for selecting the chosen tools, equipment and materials can be given.

Element 5.2A.2 Prepare for soldering

Criteria 5.2A.2.1

Material/device cut, shaped and/or drilled to specification.

Assessor guide: observe that –
Where appropriate, the material/ device to be soldered is cut, shaped and/or drilled to specifications in accordance with standard operating procedures.

Assessor guide: confirm that –
The procedures for cutting, shaping and/or drilling materials/devices to be soldered can be given. The specifications to which the material/device is to be cut, shaped and/or drilled can be identified. The tools and equipment to be used to cut, shape and/or drill the material/device can be identified. The reasons for selecting the chosen tools and equipment can be given.

Criteria 5.2A.2.2

Materials/devices cleaned to specifications using correct and appropriate materials and procedures.

Assessor guide: observe that –

The material/device to be soldered is cleaned in conformance to specifications in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for cleaning materials/devices prior to soldering can be given. The materials to be used to clean the materials/devices to be soldered can be identified. The safety precautions to be taken when cleaning materials and devices to be soldered can be identified.

Criteria 5.2A.2.3

Correct and appropriate set up and/or mounting techniques used.

Assessor guide: observe that –

The materials/devices to be soldered are correctly set up and/or mounted in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for setting up and mounting materials/devices to be soldered can be given. The tools, techniques and equipment to be used when setting up and mounting materials/devices to be soldered can be identified.

Element 5.2A.3 Solder materials**Criteria 5.2A.3.1**

Material/device mounted to specifications using correct and appropriate tools and techniques.

Assessor guide: observe that –

The materials/devices to be soldered are mounted in conformance with specifications.

Assessor guide: confirm that –

The specifications pertaining to the mounting of the materials/devices to be soldered can be identified.

Criteria 5.2A.3.2

Soldering undertaken using correct and appropriate techniques including appropriate use of flux.

Assessor guide: observe that –

The materials/devices are soldered using appropriate techniques and fluxes in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for soldering materials/devices can be given. The tools, equipment and techniques to be used to solder materials/devices can be identified. The reasons for using fluxes when soldering can be explained. The reasons for selecting the chosen flux can be given.

Criteria 5.2A.3.3

Necessary techniques undertaken to protect materials/devices from heat damage.

Assessor guide: observe that –

The materials/devices being soldered are protected from heat damage using appropriate techniques in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for protecting materials/devices from heat damage can be given. The tools and techniques to be used to minimise heat damage to materials/devices being soldered can be identified. The consequences of not protecting materials/devices from heat damage can be given.

Criteria 5.2A.3.4

Printed circuit boards, assemblies and components are handled in such a way as to prevent electrostatic discharge or mechanical damage.

Assessor guide: observe that –

Printed circuit boards, assemblies and components are handled so as to prevent electrostatic discharge or mechanical damage.

Assessor guide: confirm that –

The procedures for handling printed circuit boards, assemblies and components to prevent electrostatic discharge can be given. The precautions to be taken to prevent mechanical damage to printed circuit boards, assemblies and components can be identified. The tools, techniques and equipment to be used to prevent electrostatic discharge can be identified. The consequences of inappropriate handling of printed circuit boards, assemblies and components can be explained.

Element 5.2A.4 Test/inspect soldered joints**Criteria 5.2A.4.1**

Visual inspection carried out to ensure compliance with specifications.

Assessor guide: observe that –

All soldered joints are visually inspected to ensure compliance with specifications in accordance with standard operating procedures. Where appropriate, joints not complying with specifications are marked for rework or repair in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for inspecting soldered joints can be given. The specifications of the soldered joint can be identified. The procedures for marking items for rework or repair can be given.

Criteria 5.2A.4.2

Where required, mechanical/electrical tests undertaken using correct and appropriate techniques and equipment to ensure compliance with specifications.

Assessor guide: observe that –

Where appropriate, soldered joints are mechanically and/or electrically tested for compliance with specifications, using appropriate techniques and equipment, in accordance with standard operating procedures. Where appropriate, joints not complying with specifications are marked for rework or repair in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for conducting mechanical and electrical tests on soldered joints can be given. The tools, techniques and equipment necessary to carry out the mechanical and electrical tests on the soldered joints can be identified. The precautions to be taken when testing soldered joints can be identified. The specifications of the soldered joint can be identified.

Element 5.2A.5 Rework/repair faulty joints including desoldering**Criteria 5.2A.5.1**

Rework/repair carried out to ensure compliance with specifications.

Assessor guide: observe that –

The faulty joint(s) are reworked/ repaired in conformance to specifications in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for reworking/ repairing faulty joints can be given. The precautions to be taken when reworking/repairing faulty joints can be given.

Criteria 5.2A.5.2

Repair/rework inspected and tested.

Assessor guide: observe that –

The repaired/reworked soldered joints are inspected and tested for conformance to specifications in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for inspecting and testing reworked/repared soldered joints can be given. The precautions to be taken when inspecting and testing reworked/ repaired soldered joints can be identified.

Range statement

This unit covers soldering/desoldering for the installation and fabrication of electrical/electronic components to advanced or military specifications, or where the reliability of electrical connections is critical. It also covers the soldering of electronic components where prevention of damage through electrostatic discharge or other means is required. Work undertaken autonomously using predetermined standards of quality, safety and work procedures. This unit has limited application and should be confined to work undertaken on equipment where continuous performance is critical and this may include work to military specifications. This unit can also cover the soldering of electronic Surface Mount Devices (SMD). Work is undertaken in a workshop, laboratory or in situ. Correct and appropriate tools and equipment may include all types of irons, pliers, side cutters, brushes, files, soldering tips, solder syringes, holding devices etc. Appropriate handling includes correct methods to avoid damage due to electrostatic discharge, manual handling or heat damage to components. Correct and appropriate materials may include solder (solid, resin cord and paste), flux (resin or powder) etc. All materials and procedures determined from specifications, manufacturer's data sheets, standard operating procedures or in consultation with a technical expert. Tests and inspections carried out using visual, mechanical or electrical techniques. All work undertaken to legislative and regulatory requirements. If precision electro measurement is required it is covered by another unit. Depending on the actual soldering job, hand and power tools and drawing interpretation skills may be required. These are covered by Unit 18.1A (Use hand tools), Unit 18.2A (Use power tools/hand held operations) and Unit 9.2A (Interpret technical drawing). Manual soldering for the installation and fabrication of electrical/electronic components, where reliability of connections is not critical, is covered by Unit 5.1A (Manual soldering/desoldering - electrical/electronic components).

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with high reliability soldering and desoldering or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 5.3A A Soft soldering (basic)

Band – Specialisation band A

Field – Fabrication

Unit Weight 2

Element 5.3A.1 Identify job requirements

Criteria 5.3A.1.1

Soldering requirements identified and correctly understood from job sheets or instructions.

Assessor guide: observe that –
Job sheets and/or instructions obtained in accordance with work site procedures.

Assessor guide: confirm that –
The tasks to be undertaken can be identified. The soft soldering requirements can be identified.

Element 5.3A.2 Undertake soft soldering

Criteria 5.3A.2.1

Correct and appropriate tools, equipment and consumables assembled and prepared for use as required.

Assessor guide: observe that –
The necessary tools, equipment and consumables are prepared for use in accordance with standard operating procedures.

Assessor guide: confirm that –
The appropriate tools and equipment to carry out soft soldering operations can be identified. The consumables associated with soft soldering operations can be identified. The effect of material to be soft soldered on the selection of consumables can be given.

Criteria 5.3A.2.2

Materials to be soldered are prepared, arranged and checked as required, to ensure solder joint meets specifications.

Assessor guide: observe that –
The materials to be soldered are prepared for soldering in accordance with standard operating procedures.

Assessor guide: confirm that –
The preparation requirements of the materials to be soldered can be identified. The reasons for preparing surfaces prior to soldering can be given.

Criteria 5.3A.2.3

Correct and appropriate techniques used to apply soft solder in accordance with standard operating procedures.

Assessor guide: observe that –
Soft solder is applied in accordance with specifications and standard operating procedures.

Assessor guide: confirm that –
A variety of soldering techniques and their application can be identified.

Criteria 5.3A.2.4

Solder joint cleaned and checked for compliance with specifications using standard operating procedures.

Assessor guide: observe that –
The soldered joint is cleaned in accordance with standard operating procedures. The soldered joint is checked for conformance to specifications.

Assessor guide: confirm that –
Appropriate methods of cleaning soldered joints can be identified. Defects in soldered joints can be identified. The procedures for rectifying defects in soldered joints can be given.

Range statement

This unit applies to soft soldering applications of ferrous and non ferrous materials such as sheet metal etc. using straightforward techniques, where heat damage to components or finish of soldered joint is not critical. All work is undertaken to predetermined standards of quality, safety and procedures. Techniques of applying soft solder may include the use of soldering irons (all types) and direct flame or other heating devices. Maintenance of soldering irons is limited to the replacement and/or cleaning of soldering tips. Preparation of materials includes cleaning, deburring, twisting of conductors and fluxing. This unit should not be selected if Unit 5.1A (Manual soldering/desoldering - electrical/electronic components) or Unit 10.2A (Terminate and connect electrical wiring) has already been selected. Depending on the actual soldering job, hand and power tools and drawing and interpretation skills may be required. These are covered by units 18.1A (Use hand tools), 18.2A (Use power tools/hand held operations) and 9.1A (Draw and interpret sketch).

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the soft soldering of joints or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 5.4A B Perform routine oxy acetylene welding

Band – Specialisation band A

Field – Fabrication

Unit Weight 2

Element 5.4A.1 Prepare materials for welding

Criteria 5.4A.1.1

Weld requirements are determined in accordance with job specifications.

Assessor guide: observe that –

All appropriate specifications and drawings are obtained in accordance with work site procedures.

Assessor guide: confirm that –

The weld requirements can be identified. The weld specifications can be identified. The location and size of welds can be identified.

Criteria 5.4A.1.2

Material is cleaned and prepared using appropriate tools and techniques in accordance with standard operating procedures.

Assessor guide: observe that –

The materials to be welded are cleaned and prepared using appropriate tools and techniques in accordance with standard operating procedures.

Assessor guide: confirm that –

The materials preparation required prior to welding can be identified. The tools and techniques appropriate to the preparation of materials to be welded can be identified.

Element 5.4A.2 Assemble and set up welding equipment

Criteria 5.4A.2.1

Welding equipment including cylinders and regulators are assembled and set up safely and correctly in accordance with standard operating procedures.

Assessor guide: observe that –

The welding equipment is correctly assembled and set up in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for assembling and setting up oxyacetylene/fuel gas welding equipment can be given. The safety precautions to be taken when assembling and setting up oxyacetylene/fuel gas welding equipment can be identified.

Element 5.4A.3 Select welding equipment, settings, and consumables**Criteria 5.4A.3.1**

Welding tips, settings and consumables selected against job requirements, welding procedures, in accordance with standard operating procedures.

Assessor guide: observe that –

The appropriate oxygen and acetylene (or appropriate fuel gas) settings are set in accordance with standard operating procedures.

Assessor guide: confirm that –

The appropriate settings for the given task and the selected welding tips and consumables can be identified. The application of a variety of filler rods and fluxes can be given. The appropriate filler rod and flux for the given task can be identified. The reasons for selecting the chosen welding tip, filler rod and flux can be given.

Element 5.4A.4 Perform routine welding using fuel gas process**Criteria 5.4A.4.1**

Weld undertaken safely and to prescribed procedure.

Assessor guide: observe that –

All welds are performed safely and in accordance with standard operating procedure.

Assessor guide: confirm that –

The hazards associated with welding processes can be identified. Appropriate personal protection equipment and its function can be identified. The appropriate ventilation/extraction requirements can be identified.

Criteria 5.4A.4.2

Welds cleaned in accordance with standard operating procedures.

Assessor guide: observe that –

All welds are cleaned in accordance with specifications and standard operating procedures.

Assessor guide: confirm that –

The weld cleaning requirements can be identified. The appropriate tools/equipment for cleaning welds can be identified.

Range statement

Oxy acetylene welding (OAW) in this unit is intended to apply in a manufacturing or maintenance environment where welding is not required to meet Australian Standards or equivalent codes, and/or licensing requirements. The term "oxy-acetylene" is used here to describe a range of fuel gases, including acetylene, LPG, hydrogen etc. The person would work autonomously or within a team environment using predetermined standards of quality, safety, work and welding procedures. Materials welded may include low carbon steel, cast iron, etc. Preparation of materials would be minimal and include preheating, setting up jigs, fixtures, clamps, etc. Setting up may include the correct connection of hoses, blowpipes, regulators, etc., and correct settings of gas mixtures.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with routine oxyacetylene welding (fuel gas welding) or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 5.5A A Carry out mechanical cutting

Band – Specialisation band A

Field – Fabrication

Unit Weight 2

Pre-requisite units - Path 1

18.1A Use hand tools

Element 5.5A.1 Determine job requirements

Criteria 5.5A.1.1

Job specification requirements determined from job sheets and/or instructions.

Assessor guide: observe that –

Job sheets and/or instructions are obtained in accordance with work site procedures.

Assessor guide: confirm that –

The tasks to be undertaken can be identified. The specifications relating to the tasks can be identified.

Criteria 5.5A.1.2

Appropriate method/machine selected to meet specifications.

Assessor guide: observe that –

Assessor guide: confirm that –

Four different cutting methods/ machines can be identified. The appropriate cutting method/ machine to meet the cutting specifications can be identified.

Criteria 5.5A.1.3

Machine loaded and adjusted appropriately for operation consistent with standard operating procedures.

Assessor guide: observe that –

The cutting machine is loaded and adjusted in accordance with standard operating procedures.

Assessor guide: confirm that –

Element 5.5A.2 Select/set up machine tooling

Criteria 5.5A.2.1

Most appropriate tooling is selected.

Assessor guide: observe that –

The most appropriate machine tooling is selected.

Assessor guide: confirm that –

The material to be cut can be identified. The effect of the material to be cut on the machine tooling to be used can be given.

Criteria 5.5A.2.2

Tooling is correctly installed using standard operating procedures.

Assessor guide: observe that –

The cutting tool is correctly installed in accordance with standard operating procedures.

Assessor guide: confirm that –

Tooling defects can be identified. The operational requirements of the cutting tool can be identified. The safety precautions to be observed while installing the cutting tool can be identified.

Criteria 5.5A.2.3

Machine set up and adjusted using standard operating procedures.

Assessor guide: observe that –

The cutting machine is set up and adjusted in accordance with standard operating procedures.

Assessor guide: confirm that –

The adjustments that can be made to ensure optimum cutting performance can be identified.

Element 5.5A.3 Operate mechanical cutting machine**Criteria 5.5A.3.1**

Appropriate stops and guards are set and adjusted as required.

Assessor guide: observe that –

The appropriate stops and guards are set and adjusted.

Assessor guide: confirm that –

The stops to be set can be identified. All guards and their function can be identified.

Criteria 5.5A.3.2

Material secured and correctly positioned using measuring equipment as necessary.

Assessor guide: observe that –

The material is secured and correctly positioned in accordance with standard operating procedures.

Assessor guide: confirm that –

The dimensions of the part to be cut can be identified.

Criteria 5.5A.3.3

Machine started and stopped safely to standard operating procedures.

Assessor guide: observe that –

The machine is started and stopped safely in accordance with standard operating procedures.

Assessor guide: confirm that –

The safety procedures to be followed during machine start up and stopping can be identified.

Criteria 5.5A.3.4

Machine is operated to cut/hole material to specifications using standard operating procedures.

Assessor guide: observe that –

Assessor guide: confirm that –

The material is cut to size and specification in accordance with standard operating procedures.

Element 5.5A.4 Check material for conformance to specification**Criteria 5.5A.4.1**

Material is checked against specification. Machine and/or tooling adjusted as required and in process adjustments carried out as necessary.

Assessor guide: observe that –

Where appropriate, the cutting machine and/or tooling is adjusted in accordance with standard operating procedures, to ensure cut material conforms to specifications.

Assessor guide: confirm that –

The adjustments that can be made to the machine and/or tooling can be identified. The effect of those adjustments on the dimensions of the cut material can be given.

Criteria 5.5A.4.2

Material is cut and/or holed to within workplace tolerances.

Assessor guide: observe that –

The material is cut and/or holed to specification.

Assessor guide: confirm that –

The tolerances applicable to the dimensions of the cut material can be identified.

Criteria 5.5A.4.3

Material used in most economical way.

Assessor guide: observe that –

The material is used in the most economical way.

Assessor guide: confirm that –

Where appropriate, the material to be cut is marked out to ensure minimum wastage of material.

Criteria 5.5A.4.4

Codes and standards observed.

Assessor guide: observe that –

Where appropriate, relevant codes and standards are complied with.

Assessor guide: confirm that –

Any relevant codes and/or standards applicable to the work being undertaken can be identified. The requirements of those codes in terms of cut material can be identified.

Range statement

This unit may cover the operation of a number of the following activities: sawing, shearing, cropping and/or holing. Materials may include ferrous and non-ferrous metals and non-metallic products. This unit includes the set up and operation of a range of mechanical cutting and holing equipment. Examples of machines that could be covered include guillotines, croppers, cold saws, band saws, automatic saws etc. This unit does not cover hand or hand held power tools used for cutting purposes eg: circular saws, nibblers and side grinder. These skills are covered by other units, see Unit 18.1A (Use hand tools) and Unit 18.2A (Use power tools/hand held operations). Typical applications of this unit may include cutting for manufacture, production cutting and cutting of materials selected from stores in a maintenance environment. Work is undertaken autonomously or as part of a team environment to predetermined standards of quality, safety and workshop procedure. This unit does not include the skills required for operational maintenance of the equipment used, these skills are covered by Unit 7.1A (Operational maintenance of machines/equipment). For repair and welding of band saw blades where blade repair unit is not attached to the machine, refer to Unit 5.13A (Perform manual production welding).

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the mechanical cutting of materials or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 5.6A A Perform brazing and/or silver soldering

Band – Specialisation band A

Field – Fabrication

Unit Weight 2

Element 5.6A.1 Prepare materials and equipment

Criteria 5.6A.1.1

Job requirements determined from specifications and/ or instructions.

Assessor guide: observe that –

All relevant drawings, specifications and instructions are obtained in accordance with work place procedures.

Assessor guide: confirm that –

The brazing/silver soldering requirements can be identified. The specifications of the joint to be brazed/silver soldered can be identified. The location and size of the joint to be brazed/silver soldered can be identified.

Criteria 5.6A.1.2

Materials correctly prepared using appropriate tools and techniques.

Assessor guide: observe that –

The materials to be brazed/silver soldered are cleaned and prepared using appropriate tools and techniques in accordance with standard operating procedures.

Assessor guide: confirm that –

The materials preparation required prior to brazing/silver soldering can be identified. The tools and techniques appropriate to the preparation of materials to be brazed/silver soldered can be identified.

Criteria 5.6A.1.3

Materials correctly assembled/aligned to meet specifications as required.

Assessor guide: observe that –

The materials to be brazed/silver soldered are assembled/aligned to specification in accordance with standard operating procedures.

Assessor guide: confirm that –

The method of assembling/aligning the materials to be brazed/silver soldered can be identified. The reasons for selecting the chosen method of assembly/alignment can be given.

Criteria 5.6A.1.4

Distortion prevention measures identified and appropriate action taken as required.

Assessor guide: observe that –

Assessor guide: confirm that –

The procedures for minimising distortion of the materials being brazed/silver soldered can be given. The action to be taken to minimise distortion during the brazing/silver soldering process can be identified. The reasons for selecting the chosen action can be given.

Criteria 5.6A.1.5

Heating equipment assembled and set up safely and correctly in accordance with standard operating procedures.

Assessor guide: observe that –

The heating equipment is correctly and safely assembled and set up in accordance with standard operating procedures.

Assessor guide: confirm that –

The appropriate heating equipment for the given task can be identified. The procedures for assembling and setting up the chosen heating equipment can be given. The reasons for selecting the chosen heating equipment can be given. The safety precautions to be taken when assembling and setting up the heating equipment can be identified.

Criteria 5.6A.1.6

Correct and appropriate consumables selected and prepared.

Assessor guide: observe that –

Assessor guide: confirm that –

The appropriate consumables for the brazing/silver soldering process can be identified. The reasons for selecting the chosen consumables can be given.

Criteria 5.6A.1.7

Test run undertaken and verified as required.

Assessor guide: observe that –

Where appropriate, a test run is undertaken and checked for conformance to specifications in accordance with standard operating procedures.

Assessor guide: confirm that –

The reasons for undertaking test runs can be explained. The procedures for checking test runs against specifications can be given. The tools, equipment and techniques to be used in checking test runs for conformance with specifications can be identified.

Element 5.6A.2 Braze and/or silver solder**Criteria 5.6A.2.1**

Correct and appropriate process selected to meet specifications.

Assessor guide: observe that –

Assessor guide: confirm that –

Typical applications of brazing and silver soldering processes can be given. The most appropriate process for the given task can be identified. The reasons for selecting the chosen process can be given.

Criteria 5.6A.2.2

Materials preheated as required.

Assessor guide: observe that –

The materials to be joined are preheated in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for preheating the materials to be joined can be given. The precautions to be taken when preheating materials to be joined can be identified.

Criteria 5.6A.2.3

Consumables applied using correct and appropriate techniques.

Assessor guide: observe that –

The jointing material and flux are applied to the joint using correct and appropriate techniques in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures and techniques for applying flux and jointing material to the joint can be given. The effects of the use of inappropriate techniques on the performance of the jointed materials can be given.

Criteria 5.6A.2.4

Jointing material applied correctly and in appropriate quantities to meet job/specifications.

Assessor guide: observe that –

The jointing material is applied correctly and in appropriate quantities to conform to specifications.

Assessor guide: confirm that –

The joint specifications can be identified. The effect of inappropriate quantities of jointing material on the performance of the jointed materials can be given.

Criteria 5.6A.2.5

Material temperatures normalised using correct and appropriate techniques.

Assessor guide: observe that –

The temperatures of the jointed materials are normalised using correct and appropriate techniques in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for normalising the temperature of jointed materials can be given. The consequences of using inappropriate techniques to normalise the temperature of the joint can be explained.

Element 5.6A.3 Inspect joints**Criteria 5.6A.3.1**

Excess jointing materials removed using correct and appropriate techniques.

Assessor guide: observe that –

Where appropriate, excess jointing materials are removed using correct and appropriate techniques.

Assessor guide: confirm that –

The procedures for removing excess jointing material can be given. The tools and techniques to be used to remove excess jointing materials can be identified.

Criteria 5.6A.3.2

Inspection of joints undertaken to standard operating procedures.

Assessor guide: observe that –

The brazed/silver soldered joint is inspected for conformance to specifications in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for inspecting brazed/silver soldered joints can be given. The equipment and techniques to be used to inspect the joint for conformance to specifications can be identified.

Criteria 5.6A.3.3

Inspection results reported/recorded using standard operating procedures as required.

Assessor guide: observe that –

Where appropriate, the inspection results are reported/recorded in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for recording/ reporting the inspection results can be given.

Range statement

Work undertaken in a production or maintenance environment using predetermined standards of quality, safety and work procedures. Work may be undertaken autonomously or within a team environment. Heating medium can include oxyacetylene and fuel gas. Correct and appropriate consumables may include fluxes (resin or powder), all types of silver solder and brazing grades, etc. Correct and appropriate assembly of heating equipment may include cylinders, connections, hoses, tips and nozzles. All work undertaken to legislative and regulatory requirements.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with brazing and/or silver soldering or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 5.7A B Manual heating and thermal cutting

Band – Specialisation band A

Field – Fabrication

Unit Weight 2

Element 5.7A.1 Assemble/disassemble plant, equipment for manual heating and thermal cutting

Criteria 5.7A.1.1

Appropriate cutting process and/or procedure for material is selected.

Assessor guide: observe that –

All relevant job sheets, drawings and instructions are obtained in accordance with work place procedures.

Assessor guide: confirm that –

The material to be cut can be identified. The most appropriate cutting process for the material to be cut can be identified. The reasons for selecting the chosen cutting process can be given.

Criteria 5.7A.1.2

Accessories and equipment correctly selected and assembled.

Assessor guide: observe that –

The selected equipment and accessories are correctly assembled in accordance with standard operating procedures.

Assessor guide: confirm that –

The tools, equipment and techniques required to carry out the chosen cutting process can be identified. The reasons for selecting the chosen equipment and accessories can be given. The procedures for assembling the selected equipment and accessories can be given.

Element 5.7A.2 Operate heating and thermal cutting equipment

Criteria 5.7A.2.1

All safety procedures observed.

Assessor guide: observe that –

All safety procedures are followed throughout the heating and cutting processes.

Assessor guide: confirm that –

The hazards associated with manual heating and thermal cutting can be identified. The appropriate personal protective clothing and equipment can be identified.

Criteria 5.7A.2.2

Equipment start up procedures followed correctly to standard operating procedures.

Assessor guide: observe that –

The equipment is started up safely in accordance with standard operating procedures. All necessary pre-start checks are carried out in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for starting up the equipment can be given. The pre-start checks to be undertaken can be identified.

Criteria 5.7A.2.3

Equipment adjustments made correctly using standard operating procedures.

Assessor guide: observe that –

Where appropriate, the equipment is adjusted to operating specifications in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for adjusting the equipment for correct operation can be given. The adjustments that can be made to the equipment can be identified. The effect of those adjustments on the operation/performance of the equipment can be explained.

Criteria 5.7A.2.4

Appropriate cutting allowances made.

Assessor guide: observe that –

Appropriate cutting allowances are made when carrying out cutting processes.

Assessor guide: confirm that –

The dimensions/specifications of the cut material can be identified. The cutting allowance to be applied to ensure the cut material conforms to specification can be identified. The source(s) of cutting allowance information can be identified. The reasons for applying cutting allowances to the material to be cut can be explained.

Criteria 5.7A.2.5

Material used in the most economical way.

Assessor guide: observe that –

The material from which the object(s) are to be cut is used in the most economical way. Where appropriate, the material to be cut is marked out to ensure minimum wastage of material.

Assessor guide: confirm that –

The procedures for minimising waste material when cutting objects from sheet or plate can be given. The reasons for minimising waste material can be explained.

Criteria 5.7A.2.6

Defects recognised and corrective action taken to standard operating procedures.

Assessor guide: observe that –

Where appropriate, cutting defects are recognised and appropriate corrective action taken in accordance with standard operating procedures.

Assessor guide: confirm that –

Examples of cutting defects and their cause can be given. The procedures for correcting cutting defects can be given. The tools, equipment and techniques required to correct cutting defects can be identified.

Criteria 5.7A.2.7

Material heated and cut to specification.
Shape/size/length to accepted workplace standards.

Assessor guide: observe that –

The material is heated and cut to specifications in accordance with standard operating procedures.

Assessor guide: confirm that –

The specifications to which the heating and cutting to be carried out is to conform can be identified. The procedures for undertaking the heating and cutting of the material can be given.

Range statement

Work is undertaken autonomously or as part of a team. Predetermined standards of quality and safety are observed and work is carried out following standard operating procedures. Manual, straight line cutting standards observed. Manual or automatic processes used to cut and heat to specifications. Cutting may include flame gouging by hand.

All work carried out to legislative and regulatory requirements. Cutting may be applied to material of various thicknesses and types including ferrous, non-ferrous and non-metallic materials by a variety of methods which may include fuel gas, oxy fuel gas and air fuel gas. Cutting may include use of hand held and self-propelled straight line cutters. Heating may be applied to material of various thicknesses and types including ferrous, non-ferrous and non-metallic materials by a variety of methods which may include fuel gas, oxy fuel gas and air fuel gas.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with manual heating, thermal cutting and gouging or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 5.8A B Advanced manual thermal cutting, gouging and shaping

Band – Specialisation band A

Field – Fabrication

Unit Weight 2

Pre-requisite units - Path 1

5.7A Manual heating and thermal cutting

Element 5.8A.1 Assemble/disassemble plant, equipment for manual thermal cutting, gouging and shaping

Criteria 5.8A.1.1

Appropriate cutting process and procedure for material being worked is selected.

Assessor guide: observe that –

All relevant job sheets, drawings, instructions and procedures are obtained in accordance with work place procedures.

Assessor guide: confirm that –

The material to be cut can be identified. The most appropriate cutting process for the material to be cut can be identified. The reasons for selecting the chosen cutting process can be given. The shapes and sizes to be produced can be identified. The specifications for surface finish to be achieved can be identified.

Criteria 5.8A.1.2

Accessories and equipment correctly selected and assembled.

Assessor guide: observe that –

The selected equipment and accessories are correctly assembled in accordance with standard operating procedures.

Assessor guide: confirm that –

The tools, equipment and techniques required to carry out the chosen cutting process can be identified. The reasons for selecting the chosen equipment and accessories can be given. The procedures for assembling the selected equipment and accessories can be given.

Element 5.8A.2 Select equipment settings and consumables

Criteria 5.8A.2.1

Correct equipment settings and consumables selected from the appropriate standard operating procedures.

Assessor guide: observe that –

Assessor guide: confirm that –

The equipment settings can be identified. The consumables to be used can be identified. The sources of information on equipment settings and consumables to be used can be identified.

Element 5.8A.3 Operate hand held thermal cutting and shaping equipment

Criteria 5.8A.3.1

All safety procedures observed.

Assessor guide: observe that –

All safety procedures are followed throughout the heating/cutting/gouging processes.

Assessor guide: confirm that –

The hazards associated with manual heating, thermal cutting and gouging can be identified. The appropriate personal protective clothing and equipment can be identified.

Criteria 5.8A.3.2

Equipment start up procedures followed correctly to standard operating procedures.

Assessor guide: observe that –

The equipment is started up safely in accordance with standard operating procedures. All necessary pre-start checks are carried out in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for starting up the equipment can be given. The pre-start checks to be undertaken can be identified.

Criteria 5.8A.3.3

Material cut to specification Shape/profile/surface finish to accepted workplace standards.

Assessor guide: observe that –

The material is cut to specifications and in accordance with standard operating procedures.

Assessor guide: confirm that –

The specifications to which the cutting is to conform can be identified. The procedures for undertaking the cutting of the material can be given.

Criteria 5.8A.3.4

Cutting defects recognised and corrective action taken to standard operating procedures.

Assessor guide: observe that –

Where appropriate, cutting defects are recognised and appropriate corrective action taken in accordance with standard operating procedures.

Assessor guide: confirm that –

Examples of cutting defects and their cause can be given. The procedures for correcting cutting defects can be given. The tools, equipment and techniques required to correct cutting defects can be identified.

Criteria 5.8A.3.5

Material removed with minimum loss of sound metal.

Assessor guide: observe that –

The material from which the object(s) are to be cut is used in the most economical way. Where appropriate, the material to be cut is marked out to ensure minimum wastage of material.

Assessor guide: confirm that –

The procedures for minimising waste material when cutting objects from sheet or plate can be given. The reasons for minimising waste material can be explained.

Range statement

Work is undertaken autonomously or as part of a team. Predetermined standards of quality and safety are observed and work is carried out following standard operating procedures. The manual thermal cutting process is used to produce complex internal and external profiles which satisfy predetermined shape, size and surface finish specifications. Items are cut, shaped or gouged by a variety of methods which may include: oxyacetylene, oxy/hydrogen, plasma, thermal lance, carbon arc, etc.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the thermal cutting, gouging and shaping of materials or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 5.9A B Automated thermal cutting

Band – Specialisation band A

Field – Fabrication

Unit Weight 2

Element 5.9A.1 Set up material

Criteria 5.9A.1.1

Material is set up including correct procedures for stack cutting and nesting to minimise waste.

Assessor guide: observe that –

All relevant job instructions, specifications and procedures are obtained in accordance with work place procedures. The material is set up correctly in accordance with standard operating procedures.

Assessor guide: confirm that –

The material to be cut can be identified. The material set-up procedures can be given. The reasons for minimising waste can be given. The advantages of stack cutting and nesting can be given. The tools, equipment and techniques to be used to set up the material for cutting can be given.

Element 5.9A.2 Set up and use automated cutting machine

Criteria 5.9A.2.1

Appropriate cutting medium selected and set to specification.

Assessor guide: observe that –

The appropriate cutting medium is set to specifications in accordance with standard operating procedures.

Assessor guide: confirm that –

The appropriate cutting medium can be identified. The reasons for selecting the chosen cutting medium can be given. The procedures for setting cutting media can be given. The sources of the specifications to which the cutting media are to be set can be identified.

Criteria 5.9A.2.2

Process requirements determined from specifications or instructions.

Assessor guide: observe that –

Assessor guide: confirm that –

The process requirements can be identified.

Criteria 5.9A.2.3

Machine set up safely to specifications using standard operating procedures.

Assessor guide: observe that –

The machine is set up safely in conformance to specifications and in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for setting up the machine can be given. The specifications to which the machine is to be set can be identified. The hazards associated with the setting of automated thermal cutting machines can be identified. The tools, techniques and equipment necessary to set up the machine can be identified.

Criteria 5.9A.2.4

Correct program selected and loaded to standard operating procedure.

Assessor guide: observe that –

The correct program is selected and loaded in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for loading the program into the machine can be given. The correct program for the work to be undertaken can be identified. The reasons for selecting the chosen program can be given.

Criteria 5.9A.2.5

Machine datums established to specifications.

Assessor guide: observe that –

The machine datums are established in accordance with specifications and standard operating procedures.

Assessor guide: confirm that –

The procedures for establishing machine datums can be given. The specifications for the machine datums can be identified.

Element 5.9A.3 Use automated thermal cutting machine**Criteria 5.9A.3.1**

Where required cutting medium is ignited following standard operating procedures.

Assessor guide: observe that –

Where appropriate, the cutting medium is ignited in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for igniting cutting media can be given. The hazards associated with igniting cutting media can be identified.

Criteria 5.9A.3.2

Machine started using correct sequence and procedure.

Assessor guide: observe that –

The machine is started up safely in the correct sequence in accordance with standard operating procedures.

Assessor guide: confirm that –

The pre-start checks to be undertaken can be identified. The procedures for starting the machine can be given. The starting sequence can be identified. The safety precautions to be taken when starting the machine can be identified.

Criteria 5.9A.3.3

Powder marking and other tracing devices used as required to standard operating procedure.

Assessor guide: observe that –

Where appropriate, powder marking or other tracing devices are used in accordance with standard operating procedures.

Assessor guide: confirm that –

The function of powder marking and other tracing devices can be explained. The procedures for using tracing devices can be given. The safety precautions to be taken when using tracing devices can be identified.

Criteria 5.9A.3.4

Correct shut down procedure observed in accordance with standard operating procedures.

Assessor guide: observe that –

The machine is shut down safely in the correct sequence in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for shutting down the machine can be given. The shut down sequence can be identified. The safety precautions to be taken during machine shut downs can be identified.

Range statement

Use of single or multi-head machines. Use in heavy engineering for plate and pipe cutting. Person would work autonomously or as part of a team. A range of material would be used. Cutting media would include fuel gases, oxy acetylene, plasma arc, laser etc. Powder marking and magnetic, photoelectric tracing devices or numerically controlled (NC) machines may be used. Programs on numerically controlled (NC) machines are selected and loaded according to predetermined instructions.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with automated thermal cutting or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 5.10A A Undertake fabrication, forming, bending and shaping

Band – Specialisation band A

Field – Fabrication

Unit Weight 8

Pre-requisite units - Path 1

9.2A Interpret technical drawing

18.1A Use hand tools

Element 5.10A.1 Select and set up forming/shaping equipment for a specific operation

Criteria 5.10A.1.1

Most appropriate tools and equipment selected.

Assessor guide: observe that –

The most appropriate tools and equipment are selected.

Assessor guide: confirm that –

A variety of hot and cold forming/ shaping processes can be identified. The machines, tools and/or equipment required to perform those forming/shaping processes can be identified. The forming/shaping processes to be applied to the given task can be identified. The reasons for selecting the chosen tools, equipment and process(es) can be given.

Criteria 5.10A.1.2

Equipment correctly set up and adjusted for operation to standard operating procedure.

Assessor guide: observe that –

The equipment is set up and adjusted in accordance with standard operating procedures.

Assessor guide: confirm that –

The adjustments that can be made to the equipment and the effect of the adjustments on the object being formed/shaped can be identified.

Criteria 5.10A.1.3

Allowances for shrinkage, thickness, inside/outside measurements correctly made.

Assessor guide: observe that –

Where appropriate, all allowances are calculated correctly. All measurements made take account of the relevant allowances.

Assessor guide: confirm that –

The allowances to be determined when forming/shaping materials can be identified. The sources of data relating to those allowances can be identified.

Element 5.10A.2 Operate forming/shaping equipment

Criteria 5.10A.2.1

Machine safely started up and shut down to standard operating procedure.

Assessor guide: observe that –

Where appropriate, the machine is started up and shut down in accordance with standard operating procedures.

Assessor guide: confirm that –

The start up and shut down procedures, where appropriate, can be identified.

Criteria 5.10A.2.2

Material and safety guards correctly positioned.

Assessor guide: observe that –

The material is correctly positioned in the machine/equipment in accordance with standard operating procedures. All safety guards are correctly positioned before the machine/equipment is operated in accordance with standard operating procedures.

Assessor guide: confirm that –

The material positioning/feeding requirements can be identified. The location and function of all safety guards can be identified.

Criteria 5.10A.2.3

Equipment correctly operated and adjusted.

Assessor guide: observe that –

Assessor guide: confirm that –

The machine/equipment is correctly operated and adjusted where appropriate in accordance with standard operating procedures. The adjustments that can be made to the machine/equipment can be identified. The effect of those adjustments on the object to be formed/shaped can be given.

Element 5.10A.3 Form and shape material**Criteria 5.10A.3.1**

Material levelled, straightened, rolled, pressed or bent to specifications/drawings.

Assessor guide: observe that –

Drawings and/or specifications are obtained in accordance with work site procedures. The material is formed/shaped to size and specification in accordance with standard operating procedures.

Assessor guide: confirm that –

The tasks to be undertaken can be identified. The specifications relating to those tasks can be identified.

Criteria 5.10A.3.2

Correct hot or cold forming procedures followed.

Assessor guide: observe that –

The most appropriate forming/shaping process to achieve the required size and specification is utilised in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures to be followed in the forming/shaping process to be utilised can be given.

Criteria 5.10A.3.3

Final form/shape checked for compliance to specification and adjusted as necessary to standard operating procedure.

Assessor guide: observe that –

The final form/shape of the object is checked for conformance with specifications. Where appropriate, the object is reworked in accordance with standard operating procedure to ensure conformance with specifications.

Assessor guide: confirm that –

Defects in formed/shaped materials can be identified. Those defects that can be rectified by further work/adjustment can be identified.

Range statement

Work may be undertaken autonomously or as part of a team. Predetermined standards of quality and safety are observed and work is carried out following standard operating procedures. Forming, shaping and bending operations conducted on either plate, section or sheet including tube. A wide range of shapes and products are formed which may include pipework chamfers, cylinders, cones, angles, hoppers, ductwork, "square to round", "transitions," "lobster backs" and all forms of tubular shapes, including hand rails, reticulation pipework, mufflers etc. Materials may include ferrous and non ferrous and non-metallic substances. A variety of tools and equipment may be used including presses, shapers, benders, drop hammers etc. If heating or thermal cutting is required, Unit 5.7A (Manual heating and thermal cutting) should be accessed. Where mark off/out skills are required then Unit 12.7A (Mark off/out structural fabrications and shapes) should be selected.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the forming and shaping of fabricated components or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 5.11A B Assemble fabricated components

Band – Specialisation band A

Field – Fabrication

Unit Weight 8

Notes - Where welds are required to meet legislative or regulatory requirements then appropriate welding units should also be selected.

Pre-requisite units - Path 1

5.5A Carry out mechanical cutting

5.15A Weld using manual metal arc welding process

18.2A Use power tools/hand held operations

5.7A Manual heating and thermal cutting

9.2A Interpret technical drawing

5.12A Perform routine manual metal arc welding

18.1A Use hand tools

Pre-requisite units - Path 2

5.5A Carry out mechanical cutting

5.49A Perform routine gas tungsten arc welding

18.2A Use power tools/hand held operations

5.7A Manual heating and thermal cutting

9.2A Interpret technical drawing

5.19A Weld using gas tungsten arc welding process

18.1A Use hand tools

Pre-requisite units - Path 3

5.4A Perform routine oxy acetylene welding

5.22A Perform advanced welding using oxy acetylene welding process

18.2A Use power tools/hand held operations

5.5A Carry out mechanical cutting

9.2A Interpret technical drawing

5.7A Manual heating and thermal cutting

18.1A Use hand tools

Pre-requisite units - Path 4

5.5A Carry out mechanical cutting

5.50A Perform routine gas metal arc welding

18.2A Use power tools/hand held operations

5.7A Manual heating and thermal cutting

9.2A Interpret technical drawing

5.17A Weld using gas metal arc welding process

18.1A Use hand tools

Element 5.11A.1 Identify assembly method and construct jigs if required

Criteria 5.11A.1.1

Method identified and jigs constructed from engineering drawings or according to workshop practice.

Assessor guide: observe that –

Where appropriate, engineering drawings and/or specifications are obtained in accordance with work site procedures. Where appropriate, jigs are constructed to meet the requirements of the assembly process in accordance with standard operating procedures.

Assessor guide: confirm that –

A variety of methods for assembling fabricated components can be identified. The assembly method most appropriate to the components to be assembled can be identified. Any jigs required to facilitate the assembly of the components can be identified.

Criteria 5.11A.1.2

Distortion prevention/control techniques correctly applied.

Assessor guide: observe that –

Distortion prevention/control techniques are correctly applied in accordance with standard operating procedures.

Assessor guide: confirm that –

The effects of distortion of fabricated components can be identified. Distortion prevention techniques can be identified.

Element 5.11A.2 Ensure all components for assembly are available**Criteria 5.11A.2.1**

All components checked against drawings and material list.

Assessor guide: observe that –

All components required for the assembly are obtained in accordance with standard operating procedures.

Assessor guide: confirm that –

The components contained in the drawing and material list can be identified. Where appropriate, the procedures for obtaining components required for the assembly can be identified.

Element 5.11A.3 Select tools and fixtures for fabrication assembly**Criteria 5.11A.3.1**

Most appropriate equipment selected.

Assessor guide: observe that –

The most appropriate equipment for fabrication assembly is obtained, or access to the equipment organised in accordance with standard operating procedures.

Assessor guide: confirm that –

The most appropriate equipment for fabrication assembly can be identified.

Element 5.11A.4 Assemble fabricated components**Criteria 5.11A.4.1**

Material and/or fabricated components correctly positioned.

Assessor guide: observe that –

The components to be assembled are correctly positioned in accordance with drawing/specifications.

Assessor guide: confirm that –

The relative position/location of each component in the completed assembly can be identified.

Criteria 5.11A.4.2

Jigs, fixtures, tools and measuring equipment correctly adjusted and applied.

Assessor guide: observe that –

All jigs, fixtures, tools and equipment are appropriately used and adjusted in accordance with standard operating procedures.

Assessor guide: confirm that –

<p>Criteria 5.11A.4.3 Datum line correctly determined if necessary.</p>	<p><i>Assessor guide: observe that –</i> Where appropriate, the datum line is correctly marked to facilitate assembly.</p>	<p><i>Assessor guide: confirm that –</i> The function of datum lines can be explained.</p>
<p>Criteria 5.11A.4.4 Assembled components checked for position including squareness, level and alignment to specification.</p>	<p><i>Assessor guide: observe that –</i> The position of all assembled components is checked for conformance with specifications.</p>	<p><i>Assessor guide: confirm that –</i> The position requirements of the assembled components in terms of squareness, level, alignment, can be identified.</p>
<p>Criteria 5.11A.4.5 Fixing/joining techniques applied as necessary according to standard operating procedure.</p>	<p><i>Assessor guide: observe that –</i> Appropriate fixing/joining techniques are used to assemble the components in accordance with standard operating procedures.</p>	<p><i>Assessor guide: confirm that –</i> A variety of fixing/joining techniques can be identified. The most appropriate fixing/joining technique for the components to be assembled can be identified.</p>
<p>Criteria 5.11A.4.6 Assembly checked for compliance with drawing.</p>	<p><i>Assessor guide: observe that –</i> The assembly is checked visually and dimensionally for conformance to drawings and specifications.</p>	<p><i>Assessor guide: confirm that –</i> Defects associated with the assembly of fabricated components can be identified. Those defects that can be rectified by rework or adjustments can be identified.</p>
<p>Criteria 5.11A.4.7 Codes/standards interpreted and applied.</p>	<p><i>Assessor guide: observe that –</i> Where appropriate, the assembly, assembly process and technique are checked for conformance to the requirements of the relevant codes/ standards.</p>	<p><i>Assessor guide: confirm that –</i> Where appropriate, the relevant codes/standards applying to the assembly of fabricated components can be identified. Where appropriate, the requirements of the codes/standards on the assembly process and/or techniques can be identified.</p>

Range statement

All work would be carried out in accordance with legislative and regulatory requirements. Work would be undertaken using general fabricated components in either plate, pipe and section or sheet. Typical applications are transitions, pipeworks and structural fabrication, ductwork, general jobbing work, fired and unfired pressure vessels. Standards for lifting equipment are defined elsewhere. Work may be undertaken in plant or on-site. Work would be undertaken as part of a team in many instances in co-operation with those with rigging/dogging skills where necessary. In this unit alignment refers to typical structural alignment and levelling using planes and line straight edges, spirit levels, line levels, squares, etc. This unit does not cover the skills required for the assembly of fabricated engineering components, these skills are covered by the Unit 18.6A (Dismantle/repair/replace/assemble and fit engineering components). Assembly using pre-constructed jigs is covered by Unit 3.1A (Manual production assembly) or Unit 3.3A (Sheet and plate assembly).

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the assembly of fabricated components or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 5.12A B Perform routine manual metal arc welding

Band – Specialisation band A

Field – Fabrication

Unit Weight 2

Element 5.12A.1 Identify weld requirements

Criteria 5.12A.1.1

Weld requirements are identified from job instructions.

Assessor guide: observe that –

Appropriate instructions, specifications and drawings are obtained and weld requirements identified in accordance with work site procedures.

Assessor guide: confirm that –

The weld requirements for performing routine MMAW can be given.

Criteria 5.12A.1.2

Location of welds are identified in accordance with standard operating procedures and job specifications.

Assessor guide: observe that –

Location of required weld(s) identified for given tasks.

Assessor guide: confirm that –

Location of weld can be determined from standard operating procedures and job specifications.

Element 5.12A.2 Prepare materials for welding

Criteria 5.12A.2.1

Materials are cleaned and prepared ready for welding.

Assessor guide: observe that –

The materials to be welded are cleaned and prepared using appropriate tools and techniques.

Assessor guide: confirm that –

The materials preparation required prior to welding can be identified. The tools and techniques appropriate to the preparation of materials to be welded can be identified.

Element 5.12A.3 Prepare equipment for welding

Criteria 5.12A.3.1

Welding equipment is set up correctly.

Assessor guide: observe that –

Welding leads are correctly attached. Current setting is appropriate for the size and type of electrode and for position of weld.

Assessor guide: confirm that –

Different current settings can be given to suit typical situations and electrodes.

Criteria 5.12A.3.2

Correct electrodes are selected.

Assessor guide: observe that –

The correct electrode flux type and size is selected to produce the weld required and ,where applicable, according to job instructions/drawings/work specifications.

Assessor guide: confirm that –

Different electrodes can be identified and related to a typical range of welding outcomes.

Element 5.12A.4 Perform routine welding using MMAW**Criteria 5.12A.4.1**

Safe welding practices are applied.

Assessor guide: observe that –

All welds are performed in a safe manner with regard to the operator and other personnel. Precautions are taken to protect the welder and other personnel from hazards associated with welding process.

Assessor guide: confirm that –

Safe welding practices and precautions can be given. Typical hazards can be identified.

Criteria 5.12A.4.2

Materials are welded to job requirements.

Assessor guide: observe that –

Welds are produced with a minimum number of major defects. Appropriate action taken to report defects. Cause of major defects identified and required adjustments to settings/ electrodes/welding technique identified.

Assessor guide: confirm that –

Major defects and their causes relating to MMAW can be given.

Criteria 5.12A.4.3

Welds cleaned in accordance with standard operating procedures.

Assessor guide: observe that –

All welds are cleaned to specification. Standard operating procedures are followed, where applicable.

Assessor guide: confirm that –

The weld cleaning requirements can be identified. The appropriate tools/equipment for cleaning welds can be identified.

Range statement

Routine MMAW in this unit is intended to apply in a manufacturing or maintenance environment where welding is not required to meet Australian Standards or other welding codes, licensing requirements, Occupational Health and Safety regulations relating to certificated/coded welding. Fillet and butt welds in all positions would typically be performed on low carbon/mild steels. Weld preparation would be minimal and generally restricted to cleaning, using files and grinders. In circumstances where welding is required to meet Australian Standard 1554 General Purpose or equivalent codes, Occupational Health and Safety regulations and/or licensing requirements then Unit 5.15A (Weld using manual metal arc welding process) should be selected.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with routine manual arc welding or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable time frames relating to typical workplace activities.

Unit MEM 5.13A B Perform manual production welding

Band – Specialisation band A

Field – Fabrication

Unit Weight 2

Element 5.13A.1 Tack and/or weld material using appropriate welding process

Criteria 5.13A.1.1

Material is prepared for the process to be used following standard operating procedures.

Assessor guide: observe that –

The materials to be welded are prepared in accordance with standard operating procedures.

Assessor guide: confirm that –

The material preparation to be undertaken prior to welding can be identified. The tools and/or equipment to be used in preparing the material(s) can be identified.

Criteria 5.13A.1.2

Material is aligned (if required) using dedicated jigs and fixtures.

Assessor guide: observe that –

Where appropriate, jigs and fixtures are used to align materials to be welded in accordance with standard operating procedures.

Assessor guide: confirm that –

The positional relationships of parts to be welded can be identified. Where appropriate, the jigs and/or fixtures to be used to align the materials to be welded can be identified. The function of jigs and fixtures in production welding can be given.

Criteria 5.13A.1.3

Weld is carried out using appropriate welding processes to accepted workplace standards.

Assessor guide: observe that –

The tack and/or weld is performed safely in accordance with standard operating procedures.

Assessor guide: confirm that –

Weld requirements can be identified. The welding process to be used can be identified. The hazards associated with the welding process can be identified. The appropriate personal protection equipment and its function can be identified.

Range statement

Production welding, including spot, resistance, hot air, ultrasonic welding is undertaken on one of a range of metallic and non-metallic materials including low carbon steels. Guidance may be required with respect to equipment settings, choice of consumables, gas mixture and pressures. For performing automated/production welding, Unit 7.24A (Operate and monitor machine/process) or Unit 7.25A (Advanced machine/process operation) should be considered.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with manual production welding or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable time frames relating to typical workplace activities.

Unit MEM 5.14A B Monitor quality of production welding/fabrications

Band – Specialisation band A

Field – Fabrication

Unit Weight 2

Pre-requisite units - Path 1

5.12A Perform routine manual metal arc welding
18.2A Use power tools/hand held operations

5.15A Weld using manual metal arc welding process

18.1A Use hand tools

Pre-requisite units - Path 2

5.17A Weld using gas metal arc welding process
18.2A Use power tools/hand held operations

5.50A Perform routine gas metal arc welding

18.1A Use hand tools

Pre-requisite units - Path 3

5.19A Weld using gas tungsten arc welding process
18.2A Use power tools/hand held operations

5.49A Perform routine gas tungsten arc welding

18.1A Use hand tools

Pre-requisite units - Path 4

5.4A Perform routine oxy acetylene welding
18.2A Use power tools/hand held operations

5.7A Manual heating and thermal cutting

18.1A Use hand tools

Element 5.14A.1 Monitor quality of welded products

Criteria 5.14A.1.1

Weld requirements identified from specifications and/or drawings.

Assessor guide: observe that –

Drawings and/or specifications are obtained in accordance with work site procedures.

Assessor guide: confirm that –

The weld requirements can be identified.

Criteria 5.14A.1.2

Inspection procedures carried out in accordance with standard operating procedures.

Assessor guide: observe that –

The weld inspection procedures are carried out in accordance with standard operating procedures.

Assessor guide: confirm that –

The weld inspection procedures can be identified.

Criteria 5.14A.1.3

Non-conforming welds are reported and corrective action initiated in accordance with standard operating procedures.

Assessor guide: observe that –

Where appropriate, non-conforming welds are reported in accordance with standard operating procedures. Where appropriate, corrective action is initiated in accordance with standard operating procedures.

Assessor guide: confirm that –

Weld defects can be identified. Those weld defects that can be rectified by further work/rework can be identified.

Criteria 5.14A.1.4

Preset gauges used to monitor quality of welded product.

Assessor guide: observe that –

Preset gauges are used correctly in accordance with standard operating procedures.

Assessor guide: confirm that –

The preset gauges appropriate to the welded product can be identified. The function of the preset gauges can be identified.

Element 5.14A.2 Initiate testing when required**Criteria 5.14A.2.1**

Implement test requirements in accordance with standard operating procedures and any legislative or regulatory requirements.

Assessor guide: observe that –

Where appropriate, weld tests are initiated in accordance with standard operating procedures and legislative/regulatory requirements.

Assessor guide: confirm that –

Test requirements appropriate to the welded product can be identified. Where appropriate, legislative and/or regulatory requirements of the welded product can be identified. The procedures for initiating weld tests can be given.

Element 5.14A.3 Undertake procedures' reporting**Criteria 5.14A.3.1**

Data collected according to standard operating procedure.

Assessor guide: observe that –

All relevant welding data is collected in accordance with standard operating procedures.

Assessor guide: confirm that –

The weld data to be collected can be identified.

Criteria 5.14A.3.2

Prepare reports as required.

Assessor guide: observe that –

Where appropriate, weld reports are prepared in accordance with standard operating procedures.

Assessor guide: confirm that –

The weld reporting requirements can be identified. The person for whom the reports are prepared can be identified.

Range statement

This unit applies to those whose duties include the basic inspection of completed or partly completed welded fabrications produced by others in a production environment. Work would be carried out in a team environment using predetermined standards of quality, safety and standard operating procedures and to established welding procedures. Duties to be carried out in consultation with appropriately qualified supervisor or engineer. This competency would be used in a production welding environment, monitoring the quality of production fabrication work where knowledge of the welding techniques and testing procedures is required. This unit should not be selected where Unit 15.4A (Perform inspection (basic)) has already been selected.

Evidence guide

Assessment context

This unit should be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with monitoring the quality of welded products or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 5.15A B Weld using manual metal arc welding process

Band – Specialisation band A

Field – Fabrication

Unit Weight 4

Pre-requisite units - Path 1

5.12A Perform routine manual metal arc welding

18.1A Use hand tools

18.2A Use power tools/hand held operations

Element 5.15A.1 Prepare materials for welding

Criteria 5.15A.1.1

Material is correctly prepared.

Assessor guide: observe that –

All appropriate specifications and drawings are obtained.

Assessor guide: confirm that –

The weld requirements can be identified.

Criteria 5.15A.1.2

Material is correctly prepared.

Assessor guide: observe that –

Appropriate tools and techniques are used to prepare material for welding in accordance with work site procedures.

Assessor guide: confirm that –

The material preparation requirements can be identified.

Element 5.15A.2 Select welding machine components

Criteria 5.15A.2.1

Welding machine and electrodes identified.

Assessor guide: observe that –

Correct welding machine and electrodes for given task is identified against pre-determined welding procedures and specifications and/or technical drawings.

Assessor guide: confirm that –

The application of a variety of welding machines can be given. The application of the electrodes classification system can be given.

Element 5.15A.3 Assemble and set up welding equipment

Criteria 5.15A.3.1

Welding equipment assembled and set up.

Assessor guide: observe that –

Welding equipment is correctly assembled and set up to safety and work site procedures.

Assessor guide: confirm that –

The relationships between amperage, electrode and material can be given. The appropriate settings for the given applications and the selected equipment/electrodes can be identified.

Element 5.15A.4 Minimise and rectify distortion**Criteria 5.15A.4.1**

Appropriate distortion prevention measures are selected.

Assessor guide: observe that –

Appropriate distortion prevention measures are undertaken during the welding process.

Assessor guide: confirm that –

Methods of preventing distortion of welded materials can be given. The appropriate distortion prevention method for the given application can be identified.

Criteria 5.15A.4.2

Distortion is rectified.

Assessor guide: observe that –

Where appropriate, distortion of welded materials is rectified in accordance with work site procedures.

Assessor guide: confirm that –

Methods of rectifying distortion of welded materials and their applications can be given.

Element 5.15A.5 Weld to job specification using MMAW**Criteria 5.15A.5.1**

Weld deposit is to specification.

Assessor guide: observe that –

Welds are deposited according to job requirements.

Assessor guide: confirm that –

The weld requirements for similar applications can be identified.

Criteria 5.15A.5.2

Joints cleaned to specifications.

Assessor guide: observe that –

The welded joint is cleaned using appropriate tools and techniques in accordance with work site procedures.

Assessor guide: confirm that –

Methods of cleaning welded joints can be given.

Element 5.15A.6 Ensure weld conformance**Criteria 5.15A.6.1**

Defects removed with minimum loss of sound metal using correct and appropriate techniques and tools.

Assessor guide: observe that –

Where appropriate, weld defects are removed in accordance with work site procedures. A minimum amount of sound metal is removed with the defect.

Assessor guide: confirm that –

Methods of weld defect removal and their application can be given.

Criteria 5.15A.6.2

Weld joints visually inspected for conformance to specifications.

Assessor guide: observe that –

Visual defects in welded joints are identified.

Assessor guide: confirm that –

Weld discontinuities detectable visually can be given.

Element 5.15A.7 Maintain weld records

Criteria 5.15A.7.1

Weld records are completed correctly.

Assessor guide: observe that –

Weld records are accurately completed in accordance with standard operating procedures.

Assessor guide: confirm that –

The weld records to be kept can be identified. The frequency at which weld details are to be recorded can be identified. The reasons for keeping weld records can be given.

Range statement

Work undertaken autonomously or within a team environment using predetermined standards of quality, safety, work and welding procedures and the skills applied to a range of fabrication activities. A range of material suitable to heavy or light fabrication is used. Fillet and butt welds in all positions on a range of materials that may include carbon steel or stainless steel, etc. As a guide, welds produced to the standard of this unit would typically conform to Australian Standard 1554 General Purpose, American Bureau of Shipping (ABS) or equivalent. Preparation of materials may include preheating, setting up of jigs, fixtures, clamps, etc. Remedial action using thermal processes may include oxyacetylene and air arc equipment. Grinding devices may also be used. Where thermal processes, hand and/or power tools are required the appropriate specialisation units should be accessed.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the manual metal arc welding process or other competencies requiring the exercise of the skills and knowledge covered by this unit.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any drawings, specifications, catalogues, manuals, codes, standards and information relevant to the work. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment, the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities.

Unit MEM 5.16A B Perform advanced welding using manual metal arc welding process

Band – Specialisation band A

Field – Fabrication

Unit Weight 4

Pre-requisite units - Path 1

5.7A Manual heating and thermal cutting
9.2A Interpret technical drawing

5.12A Perform routine manual metal arc welding
18.1A Use hand tools

5.15A Weld using manual metal arc welding process
18.2A Use power tools/hand held operations

Element 5.16A.1 Prepare welding materials and equipment

Criteria 5.16A.1.1

Welding equipment is prepared.

Assessor guide: observe that –

Appropriate machine settings and electrodes determined from relevant documentation and instructions.

Assessor guide: confirm that –

The elements of a welding procedure can be identified and the purpose given. The purpose of pre and/or post welding heating and the methods of application can be given. The appropriate ventilation/extraction requirements can be identified.

Criteria 5.16A.1.2

Appropriate welding equipment is assembled and adjusted correctly and safely.

Assessor guide: observe that –

Welding equipment is set up safely with correct settings in accordance with standard operating procedures.

Assessor guide: confirm that –

Settings, electrodes and related equipment set-up can be given for materials and weld requirements. The purpose for the correct size of welding cable, handpiece and equipment capacity is given.

Criteria 5.16A.1.3

Materials are prepared to achieve required weld specification.

Assessor guide: observe that –

Weld and material preparation requirements are identified from given specifications. Materials are prepared correctly, using appropriate tools and techniques.

Assessor guide: confirm that –

All weld and preparation requirements to achieve code specification can be given.

Element 5.16A.2 Weld joints to code requirements using MMAW**Criteria 5.16A.2.1**

Weld requirements are interpreted correctly.

Assessor guide: observe that –

Instructions, symbols, specifications interpreted correctly, including bead size, bead placement, reinforcement, etc., and in accordance with weld procedure sheet, if available, and standard operating procedures.

Assessor guide: confirm that –

The weld requirements of nominated code can be identified. The location and size of the weld(s) to be deposited can be identified.

Criteria 5.16A.2.2

Welds are deposited correctly to specifications.

Assessor guide: observe that –

Fillet and butt welds are deposited correctly as per code requirements. Where appropriate, distortion prevention techniques are used in accordance with work site procedures. The welded joint is cleaned using appropriate tools and techniques in accordance with work site procedures.

Assessor guide: confirm that –

Methods and conditions for obtaining fillet and butt weld deposits to code requirements can be given. Distortion prevention techniques can be given.

Element 5.16A.3 Assess weld quality and rectify faults**Criteria 5.16A.3.1**

Weld joints visually inspected against specifications.

Assessor guide: observe that –

Weld are inspected against the nominated code and discontinuities identified. Decision is made as to acceptability of discontinuity as per code requirements.

Assessor guide: confirm that –

Various weld discontinuities that are detectable visually and do not conform to the code requirements can be explained. The causes of the discontinuities are given.

Criteria 5.16A.3.2

Discontinuities are removed using appropriate methods.

Assessor guide: observe that –

Where identified and does not meet code requirements, discontinuities are removed. A minimum amount of sound metal is removed with the defect. The weld conforms to the requirements of the job specification.

Assessor guide: confirm that –

Discontinuities can be identified in relation to code requirements.

Criteria 5.16A.3.3

Weld records are correctly completed and maintained.

Assessor guide: observe that –

Weld identification is applied appropriately and documentation completed correctly.

Assessor guide: confirm that –

Different welder identification systems can be given, such as numbering, bar coding, paint coding, letter stamps.

Range statement

Advanced MMAW undertaken autonomously or in a team environment using predetermined standards of quality, safety and welding procedures. Work is carried out on a range of structural sections and/or plate and/or pipe for general fabrication and may include low carbon steel, stainless steel, low alloy steel, etc. As a guide, welds produced to the standard of this unit would typically conform to Australian Standard 1554 Structural Purpose, Bureau Det Norse Verticas or equivalent. Welds are fillet and butt in all positions. Preparation of materials may include preheating, setting up of jigs, fixtures, clamps, etc. Where advanced manual thermal cutting, gouging and shaping is carried out, Unit 5.8A (Advanced manual thermal cutting, gouging and shaping) should also be selected.

Evidence guide**Assessment context**

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the manual metal arc welding process or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 5.17A B Weld using gas metal arc welding process

Band – Specialisation band A

Field – Fabrication

Unit Weight 4

Pre-requisite units - Path 1

5.50A Perform routine gas metal arc welding

18.1A Use hand tools

18.2A Use power tools/hand held operations

Element 5.17A.1 Prepare materials for gas metal arc welding

Criteria 5.17A.1.1

Weld requirements identified from specifications and/or drawings.

Assessor guide: observe that –

All appropriate specifications and drawings are obtained.

Assessor guide: confirm that –

The weld requirements for GMAW can be identified.

Criteria 5.17A.1.2

Material is correctly prepared.

Assessor guide: observe that –

Appropriate tools and techniques are used to prepare material for welding in accordance with work site procedures.

Assessor guide: confirm that –

The material preparation requirements can be identified.

Criteria 5.17A.1.3

Materials assembled/aligned to specification where required.

Assessor guide: observe that –

The materials to be welded are aligned, located and clamped to specification in accordance with work site procedures.

Assessor guide: confirm that –

Examples of material holding devices and their application can be given. The required relationship between the parts to be welded can be identified. The appropriate work holding method for the application can be identified.

Element 5.17A.2 Select welding components**Criteria 5.17A.2.1**

Welding machine settings accessories and consumables identified.

Assessor guide: observe that –

Correct welding machine, settings, gas and electrode for given task selected against pre-determined welding procedures and specifications and/or technical drawings.

Assessor guide: confirm that –

The application of weld metal transfer (short arc, spray, etc.) can be given. The application of a variety of welding machines can be given. The appropriate gas can be identified given the range of weld requirements. The appropriate electrode is selected using the electrode classification system. The appropriate welding machine for the given task can be identified. Appropriate size of contact tip and drive rollers is given. Appropriate type of liner for the task is given.

Element 5.17A.3 Assemble and set up welding equipment**Criteria 5.17A.3.1**

Welding equipment assembled and set up.

Assessor guide: observe that –

Welding equipment is correctly assembled and set up to safety and work site procedures.

Assessor guide: confirm that –

The relationships between amperage, gas flow, electrode, contact tip and roller, feed rate and material can be given. The appropriate settings for the given applications and the selected equipment/consumables can be identified.

Element 5.17A.4 Minimise and rectify distortion**Criteria 5.17A.4.1**

Appropriate distortion prevention measures are selected.

Assessor guide: observe that –

Appropriate distortion prevention measures are undertaken during the welding process.

Assessor guide: confirm that –

Methods of preventing distortion of welded materials can be given. The appropriate distortion prevention method for the given application can be identified.

Criteria 5.17A.4.2

Distortion is rectified.

Assessor guide: observe that –

Where appropriate, distortion of welded materials is rectified in accordance with work site procedures.

Assessor guide: confirm that –

Methods of rectifying distortion of welded materials and their applications can be given.

Element 5.17A.5 Weld to job specification using GMAW**Criteria 5.17A.5.1**

Weld deposit is to specification.

Assessor guide: observe that –

Welds are deposited according to job requirements.

Assessor guide: confirm that –

The weld requirements for similar GMAW applications can be identified.

Criteria 5.17A.5.2

Joints cleaned to specifications.

Assessor guide: observe that –

The welded joint is cleaned using appropriate tools and techniques in accordance with work site procedures.

Assessor guide: confirm that –

Methods of cleaning welded joints can be given.

Element 5.17A.6 Ensure weld conformance**Criteria 5.17A.6.1**

Weld joints visually inspected for conformance to specifications.

Assessor guide: observe that –

Visual defects in welded joints are identified.

Assessor guide: confirm that –

Weld discontinuities detectable visually can be given.

Criteria 5.17A.6.2

Defects removed with minimum loss of sound metal using correct and appropriate techniques and tools.

Assessor guide: observe that –

Where appropriate, weld defects are removed in accordance with work site procedures. A minimum amount of sound metal is removed with the defect.

Assessor guide: confirm that –

Methods of weld defect removal and their application can be given.

Element 5.17A.7 Maintain weld records**Criteria 5.17A.7.1**

Weld records are completed correctly.

Assessor guide: observe that –

Weld records are accurately completed in accordance with standard operating procedures.

Assessor guide: confirm that –

The weld records to be kept can be identified. The frequency at which weld details are to be recorded can be identified. The reasons for keeping weld records can be given.

Range statement

GMAW undertaken autonomously or within a team environment using predetermined standards of quality, safety, work and welding procedures and the skills applied to a range of fabrication activities. A range of material suitable to heavy or light fabrication is used. Fillet and butt welds in all positions on a range of materials that may include carbon steel or stainless steel, etc. As a guide, welds produced to the standard of this unit would typically conform to Australian Standard 1554 General Purpose, American Bureau of Shipping (ABS) or equivalent. Preparation of materials may include preheating, setting up of jigs, fixtures, clamps, etc. Remedial action using thermal processes may include oxyacetylene and air arc equipment. Grinding devices may also be used. Where thermal processes, hand and/or power tools are required the appropriate specialisation units should be accessed.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the gas metal arc welding process or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 5.18A B Perform advanced welding using gas metal arc welding process

Band – Specialisation band A

Field – Fabrication

Unit Weight 4

Pre-requisite units - Path 1

5.7A Manual heating and thermal cutting
9.2A Interpret technical drawing

5.17A Weld using gas metal arc welding process
18.1A Use hand tools

5.50A Perform routine gas metal arc welding
18.2A Use power tools/hand held operations

Element 5.18A.1 Prepare welding materials and equipment

Criteria 5.18A.1.1

Welding equipment is prepared.

Assessor guide: observe that –

Appropriate machine settings and electrodes determined from relevant documentation and instructions.

Assessor guide: confirm that –

The elements of a welding procedure can be identified and the purpose given. The purpose of pre and/or post welding heating and the methods of application can be given. The appropriate ventilation/extraction requirements can be identified.

Criteria 5.18A.1.2

Appropriate welding equipment is assembled and adjusted correctly and safely.

Assessor guide: observe that –

Welding equipment is set up safely with correct settings in accordance with standard operating procedures.

Assessor guide: confirm that –

Settings, electrodes and related equipment set-up can be given for materials and weld requirements. The purpose for the correct size of welding cable, handpiece and equipment capacity is given.

Criteria 5.18A.1.3

Materials are prepared to achieve required weld specification.

Assessor guide: observe that –

Weld and material preparation requirements are identified from given specifications. Materials are prepared correctly, using appropriate tools and techniques.

Assessor guide: confirm that –

All weld and preparation requirements to achieve code specification can be given.

Element 5.18A.2 Weld joints to code requirements using GMAW**Criteria 5.18A.2.1**

Weld requirements are interpreted correctly.

Assessor guide: observe that –

Instructions, symbols, specifications interpreted correctly, including bead size, bead placement, reinforcement, etc., and in accordance with weld procedure sheet, if available, and standard operating procedures..

Assessor guide: confirm that –

The weld requirements of nominated code can be identified. The location and size of the weld(s) to be deposited can be identified.

Criteria 5.18A.2.2

Welds are deposited correctly to specifications.

Assessor guide: observe that –

Fillet and butt welds are deposited correctly as per code requirements. Where appropriate, distortion prevention techniques are used in accordance with work site procedures. The welded joint is cleaned using appropriate tools and techniques in accordance with work site procedures.

Assessor guide: confirm that –

Methods and conditions for obtaining fillet and butt weld deposits to code requirements can be given. Distortion prevention techniques can be given.

Element 5.18A.3 Assess weld quality and rectify faults**Criteria 5.18A.3.1**

Weld joints visually inspected against specifications.

Assessor guide: observe that –

Weld are inspected against the nominated code and discontinuities identified. Decision is made as to acceptability of discontinuity as per code requirements.

Assessor guide: confirm that –

Various weld discontinuities that are detectable visually and do not conform to the code requirements can be explained. The causes of the discontinuities are given.

Criteria 5.18A.3.2

Discontinuities are removed using appropriate methods.

Assessor guide: observe that –

Where identified and does not meet code requirements, discontinuities are removed. A minimum amount of sound metal is removed with the defect. The weld conforms to the requirements of the job specification.

Assessor guide: confirm that –

Discontinuities can be identified in relation to code requirements.

Criteria 5.18A.3.3

Weld records are correctly completed and maintained.

Assessor guide: observe that –

Weld identification is applied appropriately and documentation completed correctly.

Assessor guide: confirm that –

Different welder identification systems can be given, such as numbering, bar coding, paint coding, letter stamps.

Range statement

Advanced GMAW undertaken autonomously or in a team environment using predetermined standards of quality, safety and welding procedures. Work is carried out on a range of structural sections and/or plate and/or pipe for general fabrication and may include low carbon steel, stainless steel, low alloy steel, etc. As a guide, welds produced to the standard of this unit would typically conform to Australian Standard 1554 Structural Purpose, Bureau Det Norse Verticas or equivalent. Welds would be fillet and butt in all positions. Preparation of materials may include preheating, setting up of jigs, fixtures, clamps, etc. Where advanced manual thermal cutting, gouging and shaping is carried out, Unit 5.8A (Advanced manual thermal cutting, gouging and shaping) should also be selected.

Evidence guide**Assessment context**

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the manual metal arc welding process or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 5.19A B Weld using gas tungsten arc welding process

Band – Specialisation band A

Field – Fabrication

Unit Weight 4

Pre-requisite units - Path 1

5.49A Perform routine gas tungsten arc welding

18.1A Use hand tools

18.2A Use power tools/hand held operations

Element 5.19A.1 Prepare materials for GTAW welding

Criteria 5.19A.1.1

Weld requirements identified from specifications and/or drawings.

Assessor guide: observe that –

All appropriate specifications and drawings are obtained.

Assessor guide: confirm that –

The weld requirements for GTAW can be identified.

Criteria 5.19A.1.2

Material is correctly prepared.

Assessor guide: observe that –

Appropriate tools and techniques are used to prepare material for welding in accordance with work site procedures.

Assessor guide: confirm that –

The material preparation requirements can be identified.

Criteria 5.19A.1.3

Materials are assembled/aligned to specification where required.

Assessor guide: observe that –

The materials to be welded are aligned, located and clamped to specifications in accordance with work site procedures.

Assessor guide: confirm that –

Examples of material holding devices and their application can be given. The required relationship between parts to be welded can be identified. The appropriate work holding method for a given application can be identified.

Element 5.19A.2 Select welding machine components

Criteria 5.19A.2.1

Welding machine settings accessories and consumables are identified.

Assessor guide: observe that –

Correct welding machine settings, gas and electrodes for given task is identified against pre-determined welding procedures and specifications and/or technical drawings.

Assessor guide: confirm that –

The application of a variety of welding machines can be given. The application of the electrodes classification system can be given.

Element 5.19A.3 Assemble and set up welding equipment**Criteria 5.19A.3.1**

Welding equipment assembled and set up.

Assessor guide: observe that –

Welding equipment is correctly assembled and set up to safety and work site procedures.

Assessor guide: confirm that –

The relationships between amperage, gas flow, electrode, contact tip and roller, feed rate and material can be given. The appropriate settings for the given applications and the selected equipment/electrodes can be identified.

Element 5.19A.4 Minimise and rectify distortion**Criteria 5.19A.4.1**

Appropriate distortion prevention measures are selected.

Assessor guide: observe that –

Appropriate distortion prevention measures are undertaken during the welding process.

Assessor guide: confirm that –

Methods of preventing distortion of welded materials can be given. The appropriate distortion prevention method for the given application can be identified.

Criteria 5.19A.4.2

Distortion is rectified.

Assessor guide: observe that –

Where appropriate, distortion of welded materials is rectified in accordance with work site procedures.

Assessor guide: confirm that –

Methods of rectifying distortion of welded materials and their applications can be given.

Element 5.19A.5 Weld to job specification using GTAW**Criteria 5.19A.5.1**

Weld deposit is to specification.

Assessor guide: observe that –

Welds are deposited according to job requirements.

Assessor guide: confirm that –

The weld requirements for similar GTAW applications can be identified.

Criteria 5.19A.5.2

Joints cleaned to specifications.

Assessor guide: observe that –

The welded joint is cleaned using appropriate tools and techniques in accordance with work site procedures.

Assessor guide: confirm that –

Methods of cleaning welded joints can be given.

Element 5.19A.6 Ensure weld conformance**Criteria 5.19A.6.1**

Defects removed with minimum loss of sound metal using correct and appropriate techniques and tools.

Assessor guide: observe that –

Where appropriate, weld defects are removed in accordance with work site procedures. A minimum amount of sound metal is removed with the defect.

Assessor guide: confirm that –

Methods of weld defect removal and their application can be given.

Criteria 5.19A.6.2

Weld joints visually inspected for conformance to specifications.

Assessor guide: observe that –

Visual defects in welded joints are identified.

Assessor guide: confirm that –

Weld discontinuities detectable visually can be given.

Element 5.19A.7 Maintain weld records**Criteria 5.19A.7.1**

Weld records are completed correctly.

Assessor guide: observe that –

Weld records are accurately completed in accordance with standard operating procedures.

Assessor guide: confirm that –

The weld records to be kept can be identified. The frequency at which weld details are to be recorded can be identified. The reasons for keeping weld records can be given.

Range statement

GTAW undertaken autonomously or within a team environment using predetermined standards of quality, safety, work and welding procedures and the skills applied to a range of fabrication activities. A range of material suitable to heavy or light fabrication is used. Fillet and butt welds in all positions on a range of materials that may include carbon steel or stainless steel, etc. As a guide, welds produced to the standard of this unit would typically conform to Australian Standard 1554 General Purpose, American Bureau of Shipping (ABS) or equivalent. Preparation of materials may include preheating, setting up of jigs, fixtures, clamps, etc. Remedial action using thermal processes may include oxyacetylene and air arc equipment. Grinding devices may also be used. Where thermal processes, hand and/or power tools are required the appropriate specialisation units should be accessed.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the gas tungsten arc welding process or other competencies requiring the exercise of the skills and knowledge covered by this unit.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any drawings, specifications, catalogues, manuals, codes, standards and information relevant to the work. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment, the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities.

Unit MEM 5.20A B Perform advanced welding using gas tungsten arc welding process

Band – Specialisation band A

Field – Fabrication

Unit Weight 4

Pre-requisite units - Path 1

5.7A Manual heating and thermal cutting
9.2A Interpret technical drawing

5.19A Weld using gas tungsten arc welding process
18.1A Use hand tools

5.49A Perform routine gas tungsten arc welding
18.2A Use power tools/hand held operations

Element 5.20A.1 Prepare welding materials and equipment

Criteria 5.20A.1.1

Welding equipment is prepared.

Assessor guide: observe that –

Appropriate machine settings and electrodes determined from relevant documentation and instructions.

Assessor guide: confirm that –

The elements of a welding procedure can be identified and the purpose given. The purpose of pre and/or post welding heating and the methods of application can be given. The appropriate ventilation/extraction requirements can be identified.

Criteria 5.20A.1.2

Appropriate welding equipment is assembled and adjusted correctly and safely.

Assessor guide: observe that –

Welding equipment is set up safely with correct settings in accordance with standard operating procedures.

Assessor guide: confirm that –

Settings, electrodes and related equipment set-up can be given for materials and weld requirements. The purpose for preparing the electrode tip is given. The purpose for the various gas shrouds is given. The appropriate handpiece for given welding current ranges and weld applications can be given.

Criteria 5.20A.1.3

Materials are prepared to achieve required weld specification.

Assessor guide: observe that –

Weld and material preparation requirements are identified from given specifications. Materials are prepared correctly, using appropriate tools and techniques.

Assessor guide: confirm that –

All weld and preparation requirements to achieve code specification can be given.

Element 5.20A.2 Weld joints to code requirements using GTAW**Criteria 5.20A.2.1**

Weld requirements are interpreted correctly.

Assessor guide: observe that –

Instructions, symbols, specifications interpreted correctly, including bead size, bead placement, reinforcement, etc., and in accordance with weld procedure sheet, if available, and standard operating procedures.

Assessor guide: confirm that –

The weld requirements of nominated code can be identified. The location and size of the weld(s) to be deposited can be identified.

Criteria 5.20A.2.2

Welds are deposited correctly to specifications.

Assessor guide: observe that –

Fillet and butt welds are deposited correctly as per code requirements. Where appropriate, distortion prevention techniques are used in accordance with work site procedures. The welded joint is cleaned using appropriate tools and techniques in accordance with work site procedures.

Assessor guide: confirm that –

Methods and conditions for obtaining fillet and butt weld deposits to code requirements can be given. Distortion prevention techniques can be given.

Element 5.20A.3 Assess weld quality and rectify faults**Criteria 5.20A.3.1**

Weld joints visually inspected against specifications.

Assessor guide: observe that –

Weld are inspected against the nominated code and discontinuities identified. Decision is made as to acceptability of discontinuity as per code requirements.

Assessor guide: confirm that –

Various weld discontinuities that are detectable visually and do not conform to the code requirements can be explained. The causes of the discontinuities are given.

Criteria 5.20A.3.2

Discontinuities are removed using appropriate methods.

Assessor guide: observe that –

Where identified and does not meet code requirements, discontinuities are removed. A minimum amount of sound metal is removed with the defect. The weld conforms to the requirements of the job specification.

Assessor guide: confirm that –

Discontinuities can be identified in relation to code requirements.

Criteria 5.20A.3.3

Weld records are correctly completed and maintained.

Assessor guide: observe that –

Weld identification is applied appropriately and documentation completed correctly.

Assessor guide: confirm that –

Different welder identification systems can be given, such as numbering, bar coding, paint coding, letter stamps.

Range statement

Advanced GTAW undertaken autonomously or in a team environment using predetermined standards of quality, safety and welding procedures. Work is carried out on a range of structural sections and/or plate and/or pipe for general fabrication and may include low carbon steel, stainless steel, low alloy steel, etc. As a guide, welds produced to the standard of this unit would typically conform to Australian Standard 1554 Structural Purpose, Bureau Det Norse Verticas or equivalent. Welds are fillet and butt in all positions. Preparation of materials may include preheating, setting up of jigs, fixtures, clamps, etc. Where advanced manual thermal cutting, gouging and shaping is carried out, Unit 5.8A (Advanced manual thermal cutting, gouging and shaping) should also be selected.

Evidence guide**Assessment context**

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the gas tungsten arc welding process or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 5.22A B Perform advanced welding using oxy acetylene welding process

Band – Specialisation band A

Field – Fabrication

Unit Weight 6

Pre-requisite units - Path 1

5.4A Perform routine oxy acetylene welding
18.1A Use hand tools

5.7A Manual heating and thermal cutting
18.2A Use power tools/hand held operations

9.2A Interpret technical drawing

Element 5.22A.1 Select welding equipment and consumables

Criteria 5.22A.1.1

Correct welding equipment and consumables are selected from weld procedure specifications.

Assessor guide: observe that –

All relevant job instructions, drawings, specifications etc. are obtained in accordance with work place procedures.

Assessor guide: confirm that –

The appropriate welding equipment and consumables for the given task can be identified. The appropriate settings for the given oxyacetylene welding task can be identified. The appropriate ventilation/extraction requirements can be identified. The work holding requirements can be identified. Where appropriate, pre and/or post- welding heating requirements can be identified. The purpose of pre and post-welding heating of the weld materials can be given. Examples of materials requiring pre and post-welding heating can be given.

Element 5.22A.2 Assemble welding equipment

Criteria 5.22A.2.1

Welding equipment, including cylinders, regulators, hoses, torches and tips is assembled and set up safely in accordance with standard operating procedures.

Assessor guide: observe that –

The welding equipment is correctly assembled and set up in accordance with standard operating procedures. Where appropriate, jigs, fixtures, clamps etc. are used correctly and safely in accordance with standard operating procedures.

Assessor guide: confirm that –

The appropriate settings for the given task and the selected equipment/consumables can be identified.

Element 5.22A.3 Weld joints to Australian Standard 1554 SP or equivalent**Criteria 5.22A.3.1**

Materials welded to Australian Standard 1554 SP or equivalent in all positions.

Assessor guide: observe that –

Fillet and butt welds are deposited correctly and to 1554 SP or equivalent in accordance with standard operating procedures in each of the following positions: - horizontal - vertical - overhead. Where appropriate, distortion prevention techniques are used in accordance with work site procedures. The welded joint is cleaned using appropriate tools and techniques in accordance with work site procedures.

Assessor guide: confirm that –

The weld requirements of 1554 SP (or equivalent) can be identified.

Criteria 5.22A.3.2

Instructions, symbols, specifications interpreted correctly including bead size, bead placement, reinforcement etc. and in accordance with weld procedure sheet, if available, and standard operating procedures.

Assessor guide: observe that –

Assessor guide: confirm that –

The location and size of the weld(s) to be deposited can be identified. The purpose of reinforcing areas to be welded can be given. Where appropriate, the reinforcement to be incorporated into the given weld(s) can be identified.

Element 5.22A.4 Inspect welds**Criteria 5.22A.4.1**

Weld joints visually inspected against specifications.

Assessor guide: observe that –

Welded joints are visually inspected for defects.

Assessor guide: confirm that –

Common weld defects detectable visually can be identified.

Criteria 5.22A.4.2

Weld defects identified.

Assessor guide: observe that –

Where applicable, weld defects are identified.

Assessor guide: confirm that –

Element 5.22A.5 Correct faults**Criteria 5.22A.5.1**

Defects removed with minimum loss of sound metal using correct and appropriate techniques and tools to Australian Standard 3992 or equivalent.

Assessor guide: observe that –

Where appropriate, weld defects are removed in accordance with work site procedures. A minimum amount of sound metal is removed with the defect. The weld conforms to the requirements of AS3992 or equivalent.

Assessor guide: confirm that –

The methods of weld defect removal and their application can be given.

Element 5.22A.6 Maintain weld records**Criteria 5.22A.6.1**

Weld records maintained in accordance with specifications and standard operating procedures.

Assessor guide: observe that –

Weld records are accurately completed in accordance with standard operating procedures.

Assessor guide: confirm that –

The weld records to be kept can be identified. The frequency at which weld details are to be recorded can be identified. The reasons for keeping weld records can be given.

Range statement

Advanced oxy acetylene welding carried out using a range of materials for general fabrication. The term "oxy-acetylene" is used here to describe a range of fuel gases, including acetylene, LPG, hydrogen etc. The person would work autonomously or in a team environment using predetermined standards of quality, safety and welding procedures. Weld would be applied to meet Australian Standard 1554 SP, appropriate industrial standards, or equivalent outcomes. Welds would be fillet and butt in all positions. Preparation of materials may include preheating, setting up of jigs, fixtures, clamps etc. Materials may include low carbon steel, plate, pipe, tube and round bar. Where welds comply with one of the certificates covered by Australian Standard 1796, then Unit 5.26A (Apply welding principles) should also be selected. Where advanced manual thermal cutting, gouging and shaping is carried out, Unit 5.8A (Advanced manual thermal cutting, gouging and shaping) should also be selected.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with oxyacetylene welding or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 5.23A B Weld using submerged arc welding process

Band – Specialisation band A

Field – Fabrication

Unit Weight 4

Element 5.23A.1 Prepare materials for welding

Criteria 5.23A.1.1

Weld requirements identified from specifications and/or drawings.

Assessor guide: observe that –

All appropriate specifications and drawings are obtained.

Assessor guide: confirm that –

The weld requirements can be identified.

Criteria 5.23A.1.2

Material is correctly prepared using appropriate tools and techniques.

Assessor guide: observe that –

Appropriate tools and techniques are used to prepare material for welding in accordance with work site procedures.

Assessor guide: confirm that –

The material preparation requirements can be identified.

Criteria 5.23A.1.3

Materials assembled/aligned to specifications where required.

Assessor guide: observe that –

The materials to be welded are aligned, located and clamped to specification in accordance with work site procedures.

Assessor guide: confirm that –

Examples of material holding devices and their application can be given. The required relationship between the parts to be welded can be identified. The appropriate work holding method for the application can be identified.

Element 5.23A.2 Select welding machine settings and consumables**Criteria 5.23A.2.1**

Welding machine settings and consumables identified against job requirements, welding procedures and specifications and/or technical drawings.

Assessor guide: observe that –

Assessor guide: confirm that –

The application of a variety of welding machines can be given. The application of a variety of consumables can be given. The appropriate welding machine for the given task can be identified. The appropriate consumables for the given task can be identified. The appropriate ventilation/extraction requirements can be identified.

Element 5.23A.3 Assemble and set up welding equipment**Criteria 5.23A.3.1**

Welding equipment assembled and set up safely and correctly in accordance with standard operating procedures.

Assessor guide: observe that –

Welding equipment is correctly assembled and set up in accordance with safety and work site procedures.

Assessor guide: confirm that –

The relationships between amperage, electrode and material thickness can be given. The appropriate settings for the given task and the selected equipment and consumables can be identified.

Criteria 5.23A.3.2

Test runs undertaken and verified in accordance with specifications.

Assessor guide: observe that –

Test welds are performed in accordance with work site procedures. Test welds are checked for conformance to specifications in accordance with work site procedure. Where appropriate, adjustments are made to settings to ensure conformance to specifications.

Assessor guide: confirm that –

The weld specifications to be achieved can be identified. The actions to be undertaken when test runs do not conform to specifications can be described.

Element 5.23A.4 Identify distortion prevention methods**Criteria 5.23A.4.1**

Distortion prevention measures identified.

Assessor guide: observe that –

Assessor guide: confirm that –

Methods of preventing distortion of welded materials can be given. The appropriate distortion prevention method for the given application can be identified.

Criteria 5.23A.4.2

Appropriate action taken to minimise and rectify distortion.

Assessor guide: observe that –

Appropriate distortion prevention measures are undertaken during the welding process. Where appropriate, distortion of welded materials is rectified in accordance with work site procedures.

Assessor guide: confirm that –

Methods of rectifying distortion of welded materials and their application can be given.

Element 5.23A.5 Weld joints using submerged arc by correct process**Criteria 5.23A.5.1**

Pad, butt and fillet welds deposited correctly in flat, and fillet welds in horizontal position, to specification.

Assessor guide: observe that –

Welds are deposited correctly and to AS1554 GP or equivalent in accordance with work site procedures in each of the following positions: - flat - horizontal. Where appropriate, distortion prevention techniques are used in accordance with work site procedures.

Assessor guide: confirm that –

The weld requirements of AS1554 GP (or equivalent) can be identified.

Criteria 5.23A.5.2

Joints cleaned to specifications using correct and appropriate techniques and tools.

Assessor guide: observe that –

The welded joint is cleaned using appropriate tools and techniques in accordance with work site procedures.

Assessor guide: confirm that –

Methods of cleaning welded joints can be given.

Element 5.23A.6 Inspect welds**Criteria 5.23A.6.1**

Weld joints visually inspected against specifications.

Assessor guide: observe that –

Welded joints are visually inspected for defects.

Assessor guide: confirm that –

Common weld defects detectable visually can be identified.

Criteria 5.23A.6.2

Weld defects identified.

Assessor guide: observe that –

Where applicable, weld defects are identified.

Assessor guide: confirm that –

Element 5.23A.7 Correct faults**Criteria 5.23A.7.1**

Take remedial action where required.

Assessor guide: observe that –

Where appropriate, weld defects are removed in accordance with work site procedures.

Assessor guide: confirm that –

Methods of weld defect removal and their application can be given.

Criteria 5.23A.7.2

Defects removed with minimum loss of sound metal using correct and appropriate techniques and tools.

Assessor guide: observe that –

A minimum amount of sound metal is removed with the defect.

Assessor guide: confirm that –

The tools, techniques and equipment to be used in removing weld defects can be identified.

Element 5.23A.8 Maintain weld records**Criteria 5.23A.8.1**

Weld records maintained in accordance with specifications and standard operating procedures.

Assessor guide: observe that –

Weld records are accurately completed in accordance with standard operating procedures.

Assessor guide: confirm that –

The weld records to be kept can be identified. The frequency at which weld details are to be recorded can be identified. The reasons for keeping weld records can be given.

Range statement

This work would be carried out using a range of material for heavy or light fabrication. The person would work autonomously or within a team environment using predetermined standards of quality, safety, work and welding procedures and the skills applied to a range of fabrication activities. Weld quality meets a standard up to Australian Standard 1554 General Purpose or equivalent. Materials used may include carbon steel or stainless steel. Preparation of materials would include preheating, setting up of jigs, fixtures, clamps etc. Remedial action using thermal processes may include oxyacetylene and air arc equipment. Grinding devices may also be used. Where thermal processes and/or hand and power tools are required, appropriate units should be selected. Where welds comply with one of the certificates covered by Australian Standard 1796, then Unit 5.26A (Apply welding principles) should also be selected.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the submerged arc welding process or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 5.24B A Perform welding supervision

Band – Specialisation band B

Field – Fabrication

Unit Weight 12

Pre-requisite units - Path 1

5.26A Apply welding principles

Element 5.24B.1 Prepare and determine welding procedure

Criteria 5.24B.1.1

Instruction of welders carried out to procedure.

Assessor guide: observe that –

Welders are instructed in the welding procedure(s) to be followed. All relevant job instructions, drawings, specifications, codes, standards and information are obtained in accordance with workplace procedures.

Assessor guide: confirm that –

The welding procedures to be followed in carrying out specified welds can be identified. The welders to be involved in the particular welding process can be identified. The reporting and recording requirements with reference to the particular welding process can be identified.

Criteria 5.24B.1.2

Welding parameters are determined in accordance with procedures.

Assessor guide: observe that –

Assessor guide: confirm that –

The procedures for determining the welding parameters can be given. The welding parameters applicable to the particular welding process can be identified. The effects of varying welding parameters on the quality of the welds produced can be explained. The reasons for selecting the chosen welding parameters can be given.

Criteria 5.24B.1.3

Variables and sequence checks are planned against documentation.

Assessor guide: observe that –

The welding procedures are planned and documented in accordance with the relevant codes and/or standards.

Assessor guide: confirm that –

The procedures for planning welding procedures can be given. The relevant codes and/or standards can be identified. The variables to be checked during the welding process can be identified. The sequence of checks to be undertaken can be identified. The reasons for selecting the chosen sequence of checks on the welding process and variables can be explained.

Criteria 5.24B.1.4

Appropriate documentation prepared for record keeping.

Assessor guide: observe that –

The welding procedures are documented in accordance with the relevant codes and/or standards. The welding records to be completed are prepared and authorised in accordance with standard operating procedures.

Assessor guide: confirm that –

The welding records to be kept can be identified. The procedures for preparing and authorising welding records can be given. The procedures for documenting welding procedures can be given.

Element 5.24B.2 Qualify welders to required procedures**Criteria 5.24B.2.1**

Welders trained regarding procedures.

Assessor guide: observe that –

Welders are trained in the welding procedures in accordance with standard operating procedures.

Assessor guide: confirm that –

The objectives of the training can be given. The procedures for training welders can be given. All necessary materials and equipment for the welding procedures to be undertaken can be identified. The competencies to be achieved by the welders can be identified.

Criteria 5.24B.2.2

Welders tested regarding procedures.

Assessor guide: observe that –

Welders are tested in the welding procedures for which they are being trained.

Assessor guide: confirm that –

The testing procedures can be identified.

Criteria 5.24B.2.3

Reports on the welder's performance regarding procedures are maintained.

Assessor guide: observe that –

The performance of welders being trained in the welding procedures is reported in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for reporting welder performance during training can be given. The competencies to be reported on can be identified.

Element 5.24B.3 Monitor/maintain quality assurance and safety procedures**Criteria 5.24B.3.1**

Internal QA plan monitored.

Assessor guide: observe that –

The welding processes are monitored in accordance with standard operating procedures.

Assessor guide: confirm that –

The internal quality assurance plan can be described. The weld monitoring requirements of the quality assurance plan can be identified. The procedures for monitoring the welding process can be given.

Criteria 5.24B.3.2

Traceability of materials ensured.

Assessor guide: observe that –

The materials used in a nominated weld can be traced to their source in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for tracing weld materials throughout the welding process can be given. The records to be kept to ensure that all materials can be traced through the welding process to their source can be identified. The reasons for ensuring weld materials can be traced can be explained.

Criteria 5.24B.3.3

Welding supervised to ensure compliance with prescribed specifications and/or documented procedures and/or safety procedures.

Assessor guide: observe that –

The welding process is supervised to ensure that the welds are produced in compliance with specifications in accordance with the documented welding and safety procedures.

Assessor guide: confirm that –

The safety procedures to be followed when carrying out the welding process can be given. The specifications of the weld to be produced can be identified. The reasons for supervising the welding process can be explained.

Element 5.24B.4 Prepare documents**Criteria 5.24B.4.1**

Recording of the procedure against pre-qualifying procedures carried out.

Assessor guide: observe that –

The welding procedures are recorded in accordance with the relevant codes, standards and procedures.

Assessor guide: confirm that –

The pre-qualifying procedures can be given. The recording requirements for welding procedures can be identified.

Criteria 5.24B.4.2

Findings on internal QA plan recorded.

Assessor guide: observe that –

The results obtained with respect to welds undertaken are recorded in accordance with the internal quality assurance plan.

Assessor guide: confirm that –

The weld recording requirements of the internal quality assurance plan can be identified. The results of the weld checks and tests carried out as part of the internal quality assurance plan can be identified.

Element 5.24B.5 Arrange for non-destructive testing and destructive testing**Criteria 5.24B.5.1**

Conducting of appropriate testing is ensured.

Assessor guide: observe that –

Appropriate weld tests are initiated in accordance with the welding procedures.

Assessor guide: confirm that –

The weld tests to be carried out can be identified. A variety of weld testing procedures can be identified. The purpose of each weld test can be given. The procedures for initiating the testing of welds by internal/external personnel can be identified. The tests to be conducted for compliance with the welding procedures can be identified.

Criteria 5.24B.5.2

Verify that non-destructive testing/destructive testing reports conform to requirements.

Assessor guide: observe that –

The reports of the weld testing carried out in accordance with the weld procedures are obtained from the appropriate testing authority.

Assessor guide: confirm that –

The authority responsible for testing the welds can be identified. The information to be recorded for each weld test can be identified. Any discrepancies between the weld test report and the reporting/ recording requirements can be identified. The consequence of incomplete or inappropriate reporting of weld tests can be explained. The procedures for dealing with incomplete/inappropriate weld test records can be given.

Range statement

Competencies in this unit are based on wide knowledge of welding science, processes, procedures and technical requirements. Individuals working in this field would hold at least one certificate satisfying the requirements of Australian Standard 1796 Certificate 1 - 9. Competencies and procedures are determined by recognised codes and standards such as Australian Standard 2214 and Australian Standard 1796 Certificate 10. All work would be conducted in accordance with job requirements, technical specifications and legislative and regulatory requirements.

Evidence guide

Assessment context

This unit should be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the supervision of welding processes or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 5.25B B Perform welding/fabrication inspection

Band – Specialisation band B

Field – Fabrication

Unit Weight 12

Pre-requisite units - Path 1

5.26A Apply welding principles

Element 5.25B.1 Select and organise/conduct appropriate non-destructive test procedures or verify previous test procedures

Criteria 5.25B.1.1

Appropriate non-destructive test or tests selected and organised/conducted in accordance with standard operating procedures or job specifications.

Assessor guide: observe that –

All relevant job instructions, specifications, codes, standards and procedures are obtained in accordance with workplace procedures. Where appropriate, the testing of welds is initiated in accordance with standard operating procedures. Where appropriate, the welds are tested in accordance with welding and standard operating procedures.

Assessor guide: confirm that –

A variety of non-destructive tests and their application can be identified. The weld specifications can be identified. The welding procedures for the given weld can be identified. The tests to be conducted can be identified. The procedures for initiating the weld tests can be given. The procedures for conducting a variety of non-destructive tests can be given. The reasons for selecting the chosen tests can be given.

Criteria 5.25B.1.2

Results of previous testing procedures verified.

Assessor guide: observe that –

The results of previous weld tests are obtained in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for obtaining previous weld tests can be given. Any discrepancies between previous and current weld tests can be identified. The reasons for any discrepancies identified can be given. The effects of testing procedures on test results can be explained. The procedures for verifying/ amending previously established weld test procedures can be given.

Element 5.25B.2 Establish welding procedure**Criteria 5.25B.2.1**

Joint design specification is interpreted.

Assessor guide: observe that –

All relevant weld design data is obtained in accordance with standard workplace procedures.

Assessor guide: confirm that –

The specifications of the welded joint can be identified.

Criteria 5.25B.2.2

Parameters are described.

Assessor guide: observe that –

Assessor guide: confirm that –

The parameters affecting the performance of the weld with respect to specifications can be identified and described.

Criteria 5.25B.2.3

Variables are checked.

Assessor guide: observe that –

The variable weld parameters are checked for conformance to specification in accordance with welding and standard operating procedures.

Assessor guide: confirm that –

The variables affecting the performance of the weld can be identified. The tools, equipment and techniques necessary to check each variable can be identified.

Criteria 5.25B.2.4

Procedures are documented.

Assessor guide: observe that –

The welding procedures are documented in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for documenting welding procedures can be given.

Element 5.25B.3 Validate welding procedures**Criteria 5.25B.3.1**

Organise preparation of a test piece.

Assessor guide: observe that –

A test piece is produced in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for preparing a weld test piece can be given.

Criteria 5.25B.3.2

Prescribed tests are arranged or conducted.

Assessor guide: observe that –

Where appropriate, the prescribed tests are conducted in accordance with standard operating procedures. Where appropriate, the prescribed tests are initiated in accordance with standard operating procedures.

Assessor guide: confirm that –

The prescribed tests can be identified. The procedures for conducting the prescribed tests can be given. The tools, equipment and techniques necessary to carry out the prescribed tests can be identified. The procedures for initiating prescribed tests can be given.

Criteria 5.25B.3.3

Test results are interpreted and report prepared identifying required action.

Assessor guide: observe that –

Test results are obtained in accordance with standard operating procedures. The test report is prepared in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for obtaining test results can be given. The procedures for reporting test results can be given. The test results are checked against weld specifications. Any discrepancies between the test results and weld specifications are identified. The reasons for any discrepancies detected can be given. The action to be taken to return the welds produced to specification can be identified. The reasons for proposing such action can be explained.

Element 5.25B.4 Ensure quality assurance procedures are carried out**Criteria 5.25B.4.1**

Material identification checked.

Assessor guide: observe that –

The material to be welded is checked for conformance to specifications.

Assessor guide: confirm that –

The specifications of the material to be welded can be identified. The methods of identifying weld materials can be given. The reasons for correctly marking/ identifying weld materials can be explained.

Criteria 5.25B.4.2

Movement of material through workshop in-site is documented.

Assessor guide: observe that –

The movement of material through the workshop is recorded in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for documenting/ recording the movement of material through the workshop can be given. The reasons for documenting/ recording the movement of material through the workshop can be explained.

Criteria 5.25B.4.3

Transferring material test certification numbers is witnessed.

Assessor guide: observe that –

The transfer of material test certification numbers from the parent material to a part cut from the parent material is witnessed in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for transferring material test certification numbers can be given. The person(s) who can witness the transfer of material test certification numbers can be identified. The reasons for witnessing the transfer of material test certification numbers can be explained.

Criteria 5.25B.4.4

Identification of consumables in accordance with welding procedures is performed.

Assessor guide: observe that –

Consumables are marked for identification in accordance with welding procedures.

Assessor guide: confirm that –

The procedures for identifying consumables can be given. The reasons for marking consumables for identification purposes can be explained.

Criteria 5.25B.4.5

Storage and use of consumables are monitored.

Assessor guide: observe that –

Welding consumables are used and stored in accordance with manufacturers' recommendations or standard operating procedures.

Assessor guide: confirm that –

The procedures for using and storing consumables can be given. The consequences of inappropriate use and/or storage of consumables can be given. The storage life of consumables can be identified.

Criteria 5.25B.4.6

Maintain and review quality records to ensure compliance with requirements.

Assessor guide: observe that –

Welding quality records are maintained in accordance with standard operating procedures. The welding records are checked for conformance with welding quality requirements in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for maintaining welding quality records can be given. The welding quality requirements of the relevant code, standard and/or welding procedure can be identified.

Element 5.25B.5 Monitor procedures in process**Criteria 5.25B.5.1**

Material forming is checked.

Assessor guide: observe that –

Where appropriate, the form of the material to be welded is checked for conformance with specifications in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for checking the form of materials to be welded can be given. The tools, techniques and equipment necessary to check the form of the materials to be welded can be identified.

Criteria 5.25B.5.2

Dimensional checks carried out.

Assessor guide: observe that –

The dimensions of the welded components are checked for conformance to specifications.

Assessor guide: confirm that –

The specifications of the welded object can be identified. The tools, techniques and equipment necessary to check the dimensions of the welded components can be identified.

Criteria 5.25B.5.3

Final inspection against specifications.

Assessor guide: observe that –

The welds are checked for conformance to specifications in accordance with the welding procedures.

Assessor guide: confirm that –

The specifications of the weld can be identified. The tests/checks to be undertaken on the weld in accordance with the welding procedures can be identified. The tools, equipment and techniques required to test/check the welds for conformance to specifications can be identified.

Range statement

All work is undertaken in accordance with legislative and regulatory requirements. Test procedures and the range of this standard are determined by the code requirements relating to welding inspection procedures eg: Australian Standard 1210, Australian Standard 1554, Welding Technology Institute of Australia specifications or equivalent. Competencies used in this unit are based on knowledge of welding science and metallurgy, mechanical properties of welded joints, heat treatment procedures and national and technical standards. Examples of test procedures include dye penetrant magnetic particle, radiographic or ultrasound tests.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with welding inspection or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 5.26A A Apply welding principles

Band – Specialisation band A

Field – Fabrication

Unit Weight 4

Notes - This unit is to be assessed in conjunction with one of the competency units which recognises certificates covered by Australian Standard 1796 - see range statement.

Element 5.26A.1 Apply all statutory and regulatory requirements to welding procedures

Criteria 5.26A.1.1

Statutory and safety requirements applied to welding.

Assessor guide: observe that –

All welding is carried out in accordance with the relevant statutory and safety requirements.

Assessor guide: confirm that –

The relevant statutory and safety requirements can be identified with respect to welding processes. The hazards associated with welding can be identified. The personal protective clothing and equipment to be used in conjunction with welding processes can be identified.

Element 5.26A.2 Interpret all welding terms, codes and symbols

Criteria 5.26A.2.1

Welding terms and symbols correctly interpreted.

Assessor guide: observe that –

Assessor guide: confirm that –

The meanings of a wide variety of given welding terms and symbols can be correctly given. The reasons for using welding symbols can be explained.

Element 5.26A.3 Determine the effects of heat treatment on metal in relation to welding**Criteria 5.26A.3.1**

Reasons for performing heat treatment are identified.

Assessor guide: observe that –

Assessor guide: confirm that –

The reasons for heat treating metal in relation to welding can be explained. Applications of each of the following heat treatment processes can be given: - pre-welding heat treatment - post-welding heat treatment - stress relieving - normalising - annealing. For given welding situations the appropriate heat treatment process to be applied can be identified. The reasons for selecting the chosen heat treatment process can be given.

Criteria 5.26A.3.2

Processes used such as pre/post heat treatment, stress relieving, normalising, annealing appropriately applied.

Assessor guide: observe that –

Where appropriate, the heat treatment process applicable to the welding undertaken is correctly applied in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedure for carrying out each of the above heat treatment processes can be given. The tools, equipment and techniques necessary to carry out the heat treatment processes can be identified.

Element 5.26A.4 Identify the logical sequence of events involved in planning a welding operation**Criteria 5.26A.4.1**

Principles of planning and setting up welding appropriately applied.

Assessor guide: observe that –

Assessor guide: confirm that –

The sequence of operations in performing a weld in accordance with AS1796 can be identified. The reasons for planning a welding operation can be given. The procedures for setting up welding and safety equipment can be given.

Criteria 5.26A.4.2

Where specified, appropriate preparation undertaken for testing of welds.

Assessor guide: observe that –

Where appropriate, welds are prepared for testing in accordance with welding procedures.

Assessor guide: confirm that –

The procedures for preparing welds for testing can be given. The tools, equipment and techniques to be used in preparing welds for testing can be identified.

Range statement

This unit describes the underpinning knowledge required to satisfy Australian Standard 1796. It should be assessed in combination with one of the units satisfying the Australian Standard 1796 Certificate 1 - 9 or other welding codes: Unit 5.16A (Perform advanced welding using manual metal arc welding process), Unit 5.18A (Perform advanced welding using gas metal arc welding process), Unit 5.20A (Perform advanced welding using gas tungsten arc welding process), Unit 5.22A (Perform advanced welding using oxyacetylene welding process) and Unit 5.23A (Weld using submerged arc welding process). Welding, planning and set up principles for a range of materials and processes are applied to satisfy Australian Standard 1796.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with welding in accordance with AS1796 Certificates 1-9 inclusive, or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 5.36A B Repair/replace/modify fabrications

Band – Specialisation band A

Field – Fabrication

Unit Weight 4

Pre-requisite units - Path 1

- 5.5A Carry out mechanical cutting
- 5.12A Perform routine manual metal arc welding
- 9.2A Interpret technical drawing

- 5.7A Manual heating and thermal cutting
- 5.15A Weld using manual metal arc welding process
- 18.1A Use hand tools

- 5.11A Assemble fabricated components
- 9.1A Draw and interpret sketch
- 18.2A Use power tools/hand held operations

Pre-requisite units - Path 2

- 5.5A Carry out mechanical cutting
- 5.17A Weld using gas metal arc welding process
- 9.2A Interpret technical drawing

- 5.7A Manual heating and thermal cutting
- 5.50A Perform routine gas metal arc welding
- 18.1A Use hand tools

- 5.11A Assemble fabricated components
- 9.1A Draw and interpret sketch
- 18.2A Use power tools/hand held operations

Pre-requisite units - Path 3

- 5.4A Perform routine oxy acetylene welding
- 5.11A Assemble fabricated components

- 5.5A Carry out mechanical cutting
- 5.22A Perform advanced welding using oxy acetylene welding process

- 5.7A Manual heating and thermal cutting
- 9.1A Draw and interpret sketch

- 9.2A Interpret technical drawing

- 18.1A Use hand tools

- 18.2A Use power tools/hand held operations

Pre-requisite units - Path 4

- 5.5A Carry out mechanical cutting
- 5.19A Weld using gas tungsten arc welding process
- 9.2A Interpret technical drawing

- 5.7A Manual heating and thermal cutting
- 5.49A Perform routine gas tungsten arc welding
- 18.1A Use hand tools

- 5.11A Assemble fabricated components
- 9.1A Draw and interpret sketch
- 18.2A Use power tools/hand held operations

Element 5.36A.1 Assess and process repair/replacement/modification requirement

Criteria 5.36A.1.1

Work requirement determined from job sheet, instruction or visual inspection.

Assessor guide: observe that –

Where appropriate, a visual inspection of the work to be done is carried out in accordance with work site procedures. All relevant job sheets and instructions are obtained in accordance with work place procedures.

Assessor guide: confirm that –

The work to be done can be identified.

Criteria 5.36A.1.2

Specifications and drawings obtained, interpreted and understood where required.

Assessor guide: observe that –

All codes, standards, specifications and drawings relevant to the work to be done are obtained in accordance with work site procedures.

Assessor guide: confirm that –

The specifications applying to the work to be done can be identified. Any codes or standards applying to the work to be done can be identified.

Criteria 5.36A.1.3

Fabrication inspected and suitability for repair/replacement/modification determined.

Assessor guide: observe that –

The fabrication is inspected for defects, faults and compliance with specifications in accordance with standard operating procedures.

Assessor guide: confirm that –

Any faults, defects and/or non-compliance with specifications that can be rectified by rework or additional work can be identified. Any faults, defects and/or non-compliance with specifications that can be rectified by replacement of components/materials can be identified. The effects of any proposed modifications on the fabrication can be given. The effects of any proposed modifications on the fabrication's specifications, operation or function can be given. The most appropriate action to be taken with respect to the fabrication (repair/replace/modify) can be identified. Appropriate reasons for the proposed action can be given.

Element 5.36A.2 Assess and process material requirements**Criteria 5.36A.2.1**

Material requirements are assessed in accordance with relevant codes, manufacturer's specifications and standard operating procedures.

Assessor guide: observe that –

Assessor guide: confirm that –

The type, quantity and size(s) of materials required to undertake the work can be identified. The reasons for selecting the chosen materials can be explained.

Criteria 5.36A.2.2

Materials are obtained/requisitioned in accordance with standard operating procedures.

Assessor guide: observe that –

The necessary materials are obtained/requisitioned in accordance with standard operating procedures.

Assessor guide: confirm that –

The appropriate procedures for procuring materials can be identified.

Criteria 5.36A.2.3

Tool and equipment requirements are assessed and obtained, where required, in accordance with standard operating procedures.

Assessor guide: observe that –

Where appropriate, the tools, equipment and consumables required are obtained/requisitioned in accordance with standard operating procedures.

Assessor guide: confirm that –

The tools, equipment and consumables required to carry out the work can be identified.

Element 5.36A.3 Prepare materials**Criteria 5.36A.3.1**

Fabrication for repair/replacement and/or modification prepared in accordance with specifications using acceptable workplace practices, tools and equipment.

Assessor guide: observe that –

The fabrication is appropriately prepared for the work to be undertaken in accordance with standard operating procedures. All precautions are taken to ensure the safety of those undertaking, or in the vicinity of the repair/replacement/modification being carried out.

Assessor guide: confirm that –

The work to be done in preparation for the repair/replacement/ modification of the fabrication can be identified. The safety procedures to be followed before, during and after the repair/replacement/modification can be identified.

Criteria 5.36A.3.2

Materials marked out and prepared to specifications with minimum wastage using correct principles, tools, equipment and procedures.

Assessor guide: observe that –

Materials are checked for conformance to specifications. Materials are marked out using appropriate tools, equipment and principles in accordance with standard operating procedures. Material wastage is minimised.

Assessor guide: confirm that –

The appropriate marking out principles can be identified.

Criteria 5.36A.3.3

Material or item for repair, replacement and/or modification is cut, bent, rolled, shaped or formed to specifications using appropriate fabrication techniques/procedures, tools and equipment.

Assessor guide: observe that –

The material is cut, bent, rolled, shaped or formed to specification in accordance with standard operating procedures. Appropriate techniques, procedures, tools and equipment are used to carry out the material preparation processes.

Assessor guide: confirm that –

The necessary material preparation processes can be identified. The procedures for accessing the necessary equipment can be identified.

Criteria 5.36A.3.4

Where required, items are marked for identification.

Assessor guide: observe that –

Where appropriate, prepared materials are marked for identification in accordance with standard operating procedures.

Assessor guide: confirm that –

The reasons for marking prepared materials for identification can be given. Where appropriate, the procedures for identifying prepared materials can be identified.

Element 5.36A.4 Repair/replacement or modification carried out

Criteria 5.36A.4.1

Using appropriate clamping methods, equipment, jigs and fixtures, materials are positioned and clamped for welding.

Assessor guide: observe that –

Materials are correctly positioned and clamped for welding. Appropriate clamping methods, equipment, jigs and fixtures are used to hold the materials to be welded.

Assessor guide: confirm that –

A range of clamping methods and their application can be given. The most appropriate clamping method(s) can be identified for the welds to be undertaken. The relative position/location of all materials to be welded can be identified.

Criteria 5.36A.4.2

Pre-tack checks undertaken and compliance with specifications determined prior to tack welding in position.

Assessor guide: observe that –

All pre-welding/tacking checks are undertaken in accordance with standard operating procedures.

Assessor guide: confirm that –

Criteria 5.36A.4.3

Welding equipment is prepared and settings adjusted according to requirements.

Assessor guide: observe that –

Welding equipment is set up and adjusted in accordance with specifications and standard operating procedures.

Assessor guide: confirm that –

The weld specifications can be identified. The equipment, consumables and settings required to achieve the weld specification can be identified.

Criteria 5.36A.4.4

Immediate work site environment is checked to ensure compliance with safety requirements and procedures.

Assessor guide: observe that –

The work site is checked for conformance with safety requirements and standard operating procedures.

Assessor guide: confirm that –

The safety requirements applicable to the work to be undertaken can be identified. The safety procedures to be followed can be identified.

Criteria 5.36A.4.5

Material or item tack welded using appropriate distortion minimisation techniques and procedures.

Assessor guide: observe that –

The materials are tack welded in accordance with standard operating procedures. Distortion of materials is minimised.

Assessor guide: confirm that –

The appropriate distortion minimisation procedures can be identified.

Criteria 5.36A.4.6

Material or item is checked against specifications prior to welding.

Assessor guide: observe that –

The materials/fabrications tack welded, are checked visually and dimensionally for conformance to specifications.

Assessor guide: confirm that –

Criteria 5.36A.4.7

Material or item is welded to specifications using appropriate techniques and procedures.

Assessor guide: observe that –

The material/fabrication is welded in accordance with standard operating procedures. The welds comply with all relevant specifications. Material distortion is minimised and where appropriate rectified.

Assessor guide: confirm that –

The weld specifications can be identified. Appropriate methods for rectifying any distortion of materials that has occurred during the welding process can be given.

Element 5.36A.5 Repair, replacements and/or modification finished and inspected**Criteria 5.36A.5.1**

Repair, replacement and/or modification cleaned and finished to specifications using appropriate workplace practices.

Assessor guide: observe that –

Materials/fabrication cleaned and finished to specification in accordance with standard operating procedures.

Assessor guide: confirm that –

Material cleaning and finishing processes and their application can be given. The most appropriate cleaning and finishing process for the given repair/replacement/modification can be identified.

Criteria 5.36A.5.2

Welds visually inspected to assess weld quality against predetermined specifications.

Assessor guide: observe that –

Welds are visually inspected for conformance to specification. Where appropriate, non-conforming welds are returned to specification in accordance with standard operating procedures.

Assessor guide: confirm that –

Criteria 5.36A.5.3

Completed repair, replacement and/or modification assessed against specifications.

Assessor guide: observe that –

The repair/replacement/modification is checked for conformance to specifications. Where appropriate the repair/replacement/modification is returned to specification in accordance with standard operating procedures.

Assessor guide: confirm that –

Criteria 5.36A.5.4

Maintenance report prepared and lodged in accordance with standard operating procedures.

Assessor guide: observe that –

Maintenance reports are prepared and lodged in accordance with standard operating procedures.

Assessor guide: confirm that –

The maintenance reporting requirements can be identified. The reasons for completing reports on repairs/replacements/modifications can be given.

Range statement

This unit should be selected where an integrated level of skills in fabrication maintenance and repair is required. This unit is intended to build on skills covered by the specialist prerequisites. If individual skills are required specialist units only should be selected. Work undertaken autonomously or in a team environment using predetermined standards of quality, safety and workplace procedures in the repair, replacement and/or modification of fabrications. Work may be carried out in workshop or on-site environments utilising welding and fabrication techniques, processes, tools, equipment and procedures on a range of materials. Processes may involve the simple mark out of materials, setting up and operation of a variety of welding and cutting plant/equipment. Where additional or more complex marking out skills are required, refer to Unit 12.7A (Mark off/out structural fabrications and shapes). If machines and equipment for forming, bending or shaping are required, Unit 5.10A (Undertake fabrication, forming, bending and shaping) should also be selected.

Evidence guide

Assessment context

This unit should be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the repair, replacement and/or modification of fabrications or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 5.37A A Geometric development

Band – Specialisation band A

Field – Fabrication

Unit Weight 6

Pre-requisite units - Path 1

2.7C10 Perform computations - basic

9.2A Interpret technical drawing

Element 5.37A.1 Transfer dimensions from a detail drawing to work

Criteria 5.37A.1.1

Specifications and work requirements determined and understood using correct and appropriate calculations.

Assessor guide: observe that –

Job instructions and specifications are obtained in accordance with work site procedures. All necessary calculations are performed correctly and accurately.

Assessor guide: confirm that –

The work to be undertaken can be identified. The specifications applicable to the work to be done can be identified.

Criteria 5.37A.1.2

Development carried out to specifications or standard operating procedures using appropriate tools and equipment.

Assessor guide: observe that –

The development is carried out accurately using appropriate techniques, procedures and equipment.

Assessor guide: confirm that –

The tools and equipment to be used in the preparation of the development can be identified.

Criteria 5.37A.1.3

Datum points correctly established.

Assessor guide: observe that –

All datum points are correctly established and appropriately marked.

Assessor guide: confirm that –

The datum points can be identified.

Element 5.37A.2 Make templates as required

Criteria 5.37A.2.1

Appropriate template material chosen.

Assessor guide: observe that –

Assessor guide: confirm that –

Materials that can be used for the preparation of templates and their application can be given. The appropriate template material for the given development/application can be identified.

Criteria 5.37A.2.2

Templates produced to specification.

Assessor guide: observe that –

The template is produced to specification in accordance with standard operating procedures. All manufacturing allowances are correctly and accurately calculated.

Assessor guide: confirm that –

The manufacturing allowances that have to be considered when developing patterns can be identified.

Criteria 5.37A.2.3

Correct storage procedures followed including labelling and identification to standard operating procedures.

Assessor guide: observe that –

Templates are labelled and stored in accordance with standard operating procedures.

Assessor guide: confirm that –

Template labelling and identification procedures can be identified. The appropriate storage requirements of templates can be identified.

Element 5.37A.3 Develop patterns as required**Criteria 5.37A.3.1**

Parallel line, radial line and triangulation development methods chosen and applied.

Assessor guide: observe that –

Patterns are developed using the appropriate method(s) in accordance with standard operating procedures.

Assessor guide: confirm that –

The three development methods and their application can be identified. The appropriate method(s) of development of a range of given objects can be identified.

Criteria 5.37A.3.2

Allowances for fabrication and assembly correctly determined and transferred.

Assessor guide: observe that –

Fabrication and assembly allowances are correctly determined and transferred to the pattern.

Assessor guide: confirm that –

The appropriate fabrication and assembly allowances can be identified. The effects of material type and thickness on fabrication and assembly allowances can be identified. The sources of data on fabrication and assembly allowances can be identified.

Element 5.37A.4 Interpret relevant codes, standards and symbols**Criteria 5.37A.4.1**

Relevant standards/codes and symbols interpreted.

Assessor guide: observe that –

Assessor guide: confirm that –

All relevant standards and codes can be identified. The meaning of symbols used in the standards/codes can be given.

Criteria 5.37A.4.2

Requirements of standards/codes interpreted and applied to materials and processes.

Assessor guide: observe that –

Where applicable, the requirements of the codes/standards are correctly applied during the geometric development process.

Assessor guide: confirm that –

The requirements of the codes/ standards applicable to the work to be done can be identified.

Element 5.37A.5 Estimate quantities of materials from detail drawings**Criteria 5.37A.5.1**

Materials correctly identified.

Assessor guide: observe that –

Assessor guide: confirm that –

The material(s) from which the component/assembly is to be manufactured can be identified.

Criteria 5.37A.5.2

Quantities estimated from drawings.

Assessor guide: observe that –

Material and component quantities are correctly determined from drawings and job specifications.

Assessor guide: confirm that –

Criteria 5.37A.5.3

Material wastage minimised.

Assessor guide: observe that –

Material wastage is minimised during the development of patterns/ templates.

Assessor guide: confirm that –

The benefits of minimising material wastage can be given.

Range statement

This unit applies to marking out of general fabrications using geometric development. Work is undertaken autonomously using predetermined standards of quality, safety and workshop procedures. The task may be performed in the workshop or in situ. Marking out is undertaken using appropriate tools and equipment, and templates and patterns are produced as required. This unit is not intended to cover the skills required for marking out activities associated with general engineering and maintenance functions. For these skills, see Units 12.6A (Mark off/out (general engineering)), 7.5A (Perform general machining), 18.6A (Dismantle/repair/replace/assemble and fit engineering components) and 18.14A (Tool, gauge and die manufacture).

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the preparation of geometric developments or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 5.38A A Advanced geometric development - cylindrical/rectangular

Band – Specialisation band A

Field – Fabrication

Unit Weight 2

This unit applies to marking out of complex cylindrical/rectangular fabrications. Fabrications may include hoppers, chutes and involve compound bends and double offsets. This unit requires advanced skills in parallel line developments.

Pre-requisite units - Path 1

2.7C10 Perform computations - basic
5.37A Geometric development

2.8C10 Perform computations
9.2A Interpret technical drawing

2.13C5 Perform mathematical computations

Element 5.38A.1 Mark off/out

Criteria 5.38A.1.1

Specifications and work requirements determined and understood using correct and appropriate calculations

Assessor guide: observe that –
Job instructions and specifications are obtained in accordance with work site procedures All necessary calculations are performed correctly and accurately

Assessor guide: confirm that –
The work to be undertaken can be identified The specifications applicable to the work to be done can be identified

Criteria 5.38A.1.2

Development carried out to specifications or standard operating procedures using appropriate tools and equipment

Assessor guide: observe that –
The development is carried out accurately using appropriate techniques, procedures and equipment

Assessor guide: confirm that –
The tools and equipment to be used in the preparation of the development can be identified

Criteria 5.38A.1.3

Datum points correctly established and indicated

Assessor guide: observe that –
All datum points are correctly established and appropriately marked

Assessor guide: confirm that –
The datum points can be identified

Criteria 5.38A.1.4

Allowances are correctly determined and marked (thickness, bend, pitch, angle, circumference, perimeter)

Assessor guide: observe that –
All allowances are calculated correctly and transferred to the material being marked out

Assessor guide: confirm that –
The reasons for making the following allowances when marking out can be given: - thickness - bend - pitch - angle - circumference - perimeter The method of calculating each allowance can be demonstrated

Element 5.38A.2 Make templates as required

Criteria 5.38A.2.1

Appropriate template material chosen

Assessor guide: observe that –

Assessor guide: confirm that –
Materials that can be used for the preparation of templates and their application can be given The appropriate template material for the given development/application can be identified

Criteria 5.38A.2.2 Templates produced	<i>Assessor guide: observe that –</i> The template is produced to specification in accordance with standard operating procedures	<i>Assessor guide: confirm that –</i> The manufacturing allowances that have to be considered when developing patterns can be identified
Criteria 5.38A.2.3 Allowances determined and transferred	<i>Assessor guide: observe that –</i> All manufacturing allowances are correctly and accurately calculated	<i>Assessor guide: confirm that –</i>
Criteria 5.38A.2.4 Templates for rolling, bending, pressing, drilling and profiling accurately produced	<i>Assessor guide: observe that –</i> Where appropriate, templates for rolling, bending, pressing, drilling and profiling are accurately produced in accordance with standard operating procedures	<i>Assessor guide: confirm that –</i> The procedures for making templates can be given The reasons for making templates for specific manufacturing operations can be explained The tools, equipment and techniques to be used to produce templates can be identified
Criteria 5.38A.2.5 Correct storage procedures followed including labelling and identification to standard operating procedures	<i>Assessor guide: observe that –</i> Templates are labelled and stored in accordance with standard operating procedures	<i>Assessor guide: confirm that –</i> Template labelling and identification procedures can be identified The appropriate storage requirements of templates can be identified
Element 5.38A.3 Develop patterns as required		
Criteria 5.38A.3.1 Most appropriate development method chosen and applied	<i>Assessor guide: observe that –</i> Patterns are developed using the appropriate method(s) in accordance with standard operating procedures	<i>Assessor guide: confirm that –</i> The three development methods and their application can be identified The appropriate method(s) of development of a range of given objects can be identified
Criteria 5.38A.3.2 Allowances correctly determined and transferred	<i>Assessor guide: observe that –</i> Fabrication and assembly allowances are correctly determined and transferred to the pattern	<i>Assessor guide: confirm that –</i> The appropriate fabrication and assembly allowances can be identified The effects of material type and thickness on fabrication and assembly allowances can be identified The source of data on fabrication and assembly allowances can be identified
Element 5.38A.4 Interpret relevant codes, standards and symbols		
Criteria 5.38A.4.1 Relevant standards/codes and symbols interpreted	<i>Assessor guide: observe that –</i>	<i>Assessor guide: confirm that –</i> All relevant standards and codes can be identified The meaning of symbols used in the standards/codes can be given

Criteria 5.38A.4.2 Requirements of standards/codes interpreted and applied to materials and processes	<i>Assessor guide: observe that –</i> Where applicable, the requirements of the codes/standards are correctly applied during the geometric development process	<i>Assessor guide: confirm that –</i> The requirements of the codes/ standards applicable to the work to be done can be identified
Element 5.38A.5 Estimate quantities of materials from engineering drawings		
Criteria 5.38A.5.1 Materials correctly identified	<i>Assessor guide: observe that –</i>	<i>Assessor guide: confirm that –</i> The material(s) from which the components/assembly is to be manufactured can be identified
Criteria 5.38A.5.2 Quantities estimated from drawings	<i>Assessor guide: observe that –</i> Material and component quantities are correctly determined from drawings and job specifications	<i>Assessor guide: confirm that –</i>
Criteria 5.38A.5.3 Material wastage minimised	<i>Assessor guide: observe that –</i> Material wastage is minimised during the development of patterns/ templates	<i>Assessor guide: confirm that –</i> The benefits of minimising material wastage can be given

Range statement

This unit applies to marking out of complex cylindrical/rectangular fabrications. Fabrications may include hoppers, chutes and involve compound bends and double offsets. This unit requires advanced skills in parallel line developments. All work undertaken in compliance with legislative and regulatory requirements to previously determined standards of safety, quality and standard operating procedures. Individuals may work autonomously or in a team environment. This unit is not intended to cover the skills required for marking out activities associated with general engineering and maintenance functions. For these skills, see Units 12.6A (Mark off/out (general engineering)), 7.5A (Perform general machining), 18.6A (Dismantle/repair/replace/assemble and fit engineering components) and 18.14A (Tool, gauge and die manufacture).

Evidence**Assessment context**

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the geometric development of cylinders and rectangles or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 5.39A A Advanced geometric development - conical

Band – Specialisation band A

Field – Fabrication

Unit Weight 2

This unit applies to the marking out of complex conical fabrications using advanced geometric development. Fabrications may include hoppers with round/rectangular branch intersections. This unit requires advanced skills for the calculation of cutting, bending lines and developments.

Pre-requisite units - Path 1

2.7C10 Perform computations - basic
5.37A Geometric development

2.8C10 Perform computations
9.2A Interpret technical drawing

2.13C5 Perform mathematical computations

Element 5.39A.1 Mark off/out

Criteria 5.39A.1.1

Specifications and work requirements determined and understood using correct and appropriate calculations

Assessor guide: observe that –
Job instructions and specifications are obtained in accordance with work site procedures All necessary calculations are performed correctly and accurately

Assessor guide: confirm that –
The work to be undertaken can be identified The specifications applicable to the work to be done can be identified

Criteria 5.39A.1.2

Development carried out to specifications or standard operating procedures using appropriate tools and equipment

Assessor guide: observe that –
The development is carried out accurately using appropriate techniques, procedures and equipment

Assessor guide: confirm that –
The tools and equipment to be used in the preparation of the development can be identified

Criteria 5.39A.1.3

Datum points correctly established and indicated

Assessor guide: observe that –
All datum points are correctly established and appropriately marked

Assessor guide: confirm that –
The datum points can be identified

Criteria 5.39A.1.4

Allowances are correctly determined and marked (thickness, bend, pitch, angle, circumference,

Assessor guide: observe that –
All allowances are calculated correctly and transferred to the material being marked out

Assessor guide: confirm that –
The reasons for making the following allowances when marking out can be given: - thickness - bend - pitch - angle - circumference - perimeter The method of calculating each allowance can be demonstrated

Element 5.39A.2 Make templates as required

Criteria 5.39A.2.1

Appropriate template material chosen

Assessor guide: observe that –

Assessor guide: confirm that –
Materials that can be used for the preparation of templates and their application can be given The appropriate template material for the given development/application can be identified

Criteria 5.39A.2.2 Templates produced	<i>Assessor guide: observe that –</i> The template is produced to specification in accordance with standard operating procedures	<i>Assessor guide: confirm that –</i> The manufacturing allowances that have to be considered when developing patterns can be identified
Criteria 5.39A.2.3 Allowances determined and transferred	<i>Assessor guide: observe that –</i> All manufacturing allowances are correctly and accurately calculated	<i>Assessor guide: confirm that –</i>
Criteria 5.39A.2.4 Templates for rolling, bending, pressing, drilling and profiling accurately produced	<i>Assessor guide: observe that –</i> Where appropriate, templates for rolling, bending, pressing, drilling and profiling are accurately produced in accordance with standard operating procedures	<i>Assessor guide: confirm that –</i> The procedures for making templates can be given The reasons for making templates for specific manufacturing operations can be explained The tools, equipment and techniques to be used to produce templates can be identified
Criteria 5.39A.2.5 Correct storage procedures followed including labelling and identification to standard operating procedures	<i>Assessor guide: observe that –</i> Templates are labelled and stored in accordance with standard operating procedures	<i>Assessor guide: confirm that –</i> Template labelling and identification procedures can be identified The appropriate storage requirements of templates can be identified
Element 5.39A.3 Develop patterns as required		
Criteria 5.39A.3.1 Most appropriate development method chosen and applied	<i>Assessor guide: observe that –</i> Patterns are developed using the appropriate method(s) in accordance with standard operating procedures	<i>Assessor guide: confirm that –</i> The three development methods and their application can be identified The appropriate method(s) of development of a range of given objects can be identified
Criteria 5.39A.3.2 Allowances correctly determined and transferred	<i>Assessor guide: observe that –</i> Fabrication and assembly allowances are correctly determined and transferred to the pattern	<i>Assessor guide: confirm that –</i> The appropriate fabrication and assembly allowances can be identified The effects of material type and thickness on fabrication and assembly allowances can be identified The sources of data on fabrication and assembly allowances can be identified
Element 5.39A.4 Interpret relevant codes, standards and symbols		
Criteria 5.39A.4.1 Relevant standards/codes and symbols interpreted	<i>Assessor guide: observe that –</i>	<i>Assessor guide: confirm that –</i> All relevant standards and codes can be identified The meaning of symbols used in the standards/codes can be given

<p>Criteria 5.39A.4.2 Requirements of standards/codes interpreted and applied to materials and processes</p>	<p><i>Assessor guide: observe that –</i> Where applicable, the requirements of the codes/standards are correctly applied during the geometric development process</p>	<p><i>Assessor guide: confirm that –</i> The requirements of the codes/ standards applicable to the work to be done can be identified</p>
<p>Element 5.39A.5 Estimate quantities of materials from engineering drawings</p>		
<p>Criteria 5.39A.5.1 Materials correctly identified</p>	<p><i>Assessor guide: observe that –</i></p>	<p><i>Assessor guide: confirm that –</i> The material(s) from which the component/assembly is to be manufactured can be identified</p>
<p>Criteria 5.39A.5.2 Quantities estimated from drawing</p>	<p><i>Assessor guide: observe that –</i> Material and component quantities are correctly determined from drawings and job specifications</p>	<p><i>Assessor guide: confirm that –</i></p>
<p>Criteria 5.39A.5.3 Material wastage minimised</p>	<p><i>Assessor guide: observe that –</i> Material wastage is minimised during the development of patterns/ templates</p>	<p><i>Assessor guide: confirm that –</i> The benefits of minimising material wastage can be given</p>

Range statement

This unit applies to the marking out of complex conical fabrications using advanced geometric development. Fabrications may include hoppers with round/rectangular branch intersections. This unit requires advanced skills for the calculation of cutting, bending lines and developments. All work undertaken in compliance with legislative and regulatory requirements to previously determined standards of safety, quality and standard operating procedures. Individuals may work autonomously or in a team environment. This unit is not intended to cover the skills required for marking out activities associated with general engineering and maintenance functions. For these skills, see Units 12.6A (Mark off/out (general engineering)), 7.5A (Perform general machining), 18.6A (Dismantle/repair/replace/assemble and fit engineering components) and 18.14A (Tool, gauge and die manufacture).

Evidence**Assessment context**

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the geometric development of cones or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 5.40A A Advanced geometric development - transitions

Band – Specialisation band A

Field – Fabrication

Unit Weight 4

This unit applies to the marking out of complex fabrications using geometric development. Fabrications may include hoppers, chutes, elliptical shapes, curves, spirals etc.

Patterns may include complex and irregular shapes. This unit requires advanced skills for the calculation of cutting, bending lines and developments.

Pre-requisite units - Path 1

2.7C10 Perform computations - basic
5.37A Geometric development

2.8C10 Perform computations
9.2A Interpret technical drawing

2.13C5 Perform mathematical computations

Element 5.40A.1 Mark off/out

Criteria 5.40A.1.1

Specifications and work requirements determined and understood using correct and appropriate calculations

Assessor guide: observe that –
Job instructions and specifications are obtained in accordance with work site procedures All necessary calculations are performed correctly and accurately

Assessor guide: confirm that –
The work to be undertaken can be identified The specifications applicable to the work to be done can be identified

Criteria 5.40A.1.2

Development carried out to specifications or standard operating procedures using appropriate tools and equipment

Assessor guide: observe that –
The development is carried out accurately using appropriate techniques, procedures and equipment

Assessor guide: confirm that –
The tools and equipment to be used in the preparation of the development can be identified

Criteria 5.40A.1.3

Datum points correctly established and indicated

Assessor guide: observe that –
All datum points are correctly established and appropriately marked

Assessor guide: confirm that –
The datum points can be identified

Criteria 5.40A.1.4

Allowances are correctly determined and marked eg: (thickness, bend, pitch, angle, circumference, contraction, etc.)

Assessor guide: observe that –
All allowances are calculated correctly and transferred to the material being marked out

Assessor guide: confirm that –
The reasons for making the following allowances when marking out can be given: - thickness - bend - pitch - angle - circumference - perimeter The method of calculating each allowance can be demonstrated

Element 5.40A.2 Make templates as required

Criteria 5.40A.2.1

Appropriate template material chosen

Assessor guide: observe that –

Assessor guide: confirm that –
Materials that can be used for the preparation of templates and their application can be given The appropriate template material for the given development/application can be identified

Criteria 5.40A.2.2 Templates produced	<i>Assessor guide: observe that –</i> The template is produced to specification in accordance with standard operating procedures	<i>Assessor guide: confirm that –</i> The manufacturing allowances that have to be considered when developing patterns can be identified
Criteria 5.40A.2.3 Allowances determined and transferred	<i>Assessor guide: observe that –</i> All manufacturing allowances are correctly and accurately calculated	<i>Assessor guide: confirm that –</i>
Criteria 5.40A.2.4 Templates for rolling, bending, pressing, drilling and profiling accurately produced	<i>Assessor guide: observe that –</i> Where appropriate, templates for rolling, bending, pressing, drilling and profiling are accurately produced in accordance with standard operating procedures	<i>Assessor guide: confirm that –</i> The procedures for making templates can be given The reasons for making templates for specific manufacturing operations can be explained The tools, equipment and techniques to be used to produce templates can be identified
Criteria 5.40A.2.5 Correct storage procedures followed including labelling and identification to standard operating procedures	<i>Assessor guide: observe that –</i> Templates are labelled and stored in accordance with standard operating procedures	<i>Assessor guide: confirm that –</i> Template labelling and identification procedures can be identified The appropriate storage requirements of templates can be identified
Element 5.40A.3 Develop patterns as required		
Criteria 5.40A.3.1 Most appropriate development method chosen and applied	<i>Assessor guide: observe that –</i> Patterns are developed using the appropriate method(s) in accordance with standard operating procedures	<i>Assessor guide: confirm that –</i> The three development methods and their application can be identified The appropriate method(s) of development of a range of given objects can be identified
Criteria 5.40A.3.2 Allowances correctly determined and transferred	<i>Assessor guide: observe that –</i> Fabrication and assembly allowances are correctly determined and transferred to the pattern	<i>Assessor guide: confirm that –</i> The appropriate fabrication and assembly allowances can be identified The effects of material type and thickness on fabrication and assembly allowances can be identified The sources of data on fabrication and assembly allowances can be identified
Element 5.40A.4 Interpret relevant codes, standards and symbols		
Criteria 5.40A.4.1 Relevant standards/codes and symbols interpreted	<i>Assessor guide: observe that –</i>	<i>Assessor guide: confirm that –</i> All relevant standards and codes can be identified The meaning of symbols used in the standards/codes can be given

Criteria 5.40A.4.2 Requirements of standards/codes interpreted and applied to materials and processes	<i>Assessor guide: observe that –</i> Where applicable, the requirements of the codes/standards are correctly applied during the geometric development process	<i>Assessor guide: confirm that –</i> The requirements of the codes/ standards applicable to the work to be done can be identified
Element 5.40A.5 Estimate quantities of materials from engineering drawings		
Criteria 5.40A.5.1 Materials correctly identified	<i>Assessor guide: observe that –</i>	<i>Assessor guide: confirm that –</i> The material(s) from which the component/assembly is to be manufactured can be identified
Criteria 5.40A.5.2 Quantities estimated from drawings	<i>Assessor guide: observe that –</i> Material and component quantities are correctly determined from drawings and job specifications	<i>Assessor guide: confirm that –</i>
Criteria 5.40A.5.3 Material wastage minimised	<i>Assessor guide: observe that –</i> Material wastage is minimised during the development of patterns/ templates	<i>Assessor guide: confirm that –</i> The benefits of minimising material wastage can be given

Range statement

This unit applies to the marking out of complex fabrications using geometric development. Fabrications may include hoppers, chutes, elliptical shapes, curves, spirals etc. Patterns may include complex and irregular shapes. This unit requires advanced skills for the calculation of cutting, bending lines and developments. All work undertaken in compliance with legislative and regulatory requirements to previously determined standards of safety, quality and standard operating procedures. Individuals may work autonomously or in a team environment. This unit is not intended to cover the skills required for marking out activities associated with general engineering and maintenance functions. For these skills, see Units 12.6A (Mark off/out (general engineering)), 7.5A (Perform general machining), 18.6A (Dismantle/repair/replace/assemble and fit engineering components) and 18.14A (Tool, gauge and die manufacture).

Evidence**Assessment context**

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the geometric development of transitions or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 5.41A A Weld using powder flame spraying

Band – Specialisation band A

Field – Fabrication

Unit Weight 4

Pre-requisite units - Path 1

5.4A Perform routine oxy acetylene welding

9.1A Draw and interpret sketch

Element 5.41A.1 Prepare work for spray welding

Criteria 5.41A.1.1

Identify spray weld requirements from specifications and/or drawings.

Assessor guide: observe that –

Spray weld requirements determined from specifications and drawings.

Assessor guide: confirm that –

The appropriate spray weld specifications can be identified.

Criteria 5.41A.1.2

Prepare work using appropriate tools and techniques.

Assessor guide: observe that –

Work is prepared using tools and techniques in accordance with workplace procedures.

Assessor guide: confirm that –

The procedures for preparing various materials can be identified.

Criteria 5.41A.1.3

Assemble/align work to specifications as required.

Assessor guide: observe that –

Work assembled/aligned to specification in accordance with workplace procedures.

Assessor guide: confirm that –

The procedures for assembling/aligning various materials can be given.

Element 5.41A.2 Select spray welding equipment and powders

Criteria 5.41A.2.1

Select appropriate spray welding equipment and consumables for work requirements.

Assessor guide: observe that –

Spray welding equipment selected for work requirements in accordance with workplace procedures.

Spray welding consumables selected for work requirements in accordance with workplace procedures.

Assessor guide: confirm that –

The procedures for selecting for spray welding equipment can be identified.

The procedures for selecting spray welding consumables can be identified.

Element 5.41A.3 Set up spray welding equipment**Criteria 5.41A.3.1**

Adjust gas setting on spray welding equipment to task requirement.

Assessor guide: observe that –

Spray welding equipment gas setting adjusted to task requirements in accordance with workplace procedures.

Assessor guide: confirm that –

The procedure for adjusting the spray weld gas settings to task requirements can be given.

Criteria 5.41A.3.2

Make test runs to verified spray weld meets specifications.

Assessor guide: observe that –

Test run made in accordance with workplace procedures.

Assessor guide: confirm that –

The procedures for making test runs can be given.

Element 5.41A.4 Implement distortion prevention/control measures**Criteria 5.41A.4.1**

Identify distortion prevention/control measures.

Assessor guide: observe that –

Assessor guide: confirm that –

The procedures for determining the appropriate distortion prevention/control can be identified.

Criteria 5.41A.4.2

Apply appropriate to distortion prevention/control measures minimise and rectify distortion.

Assessor guide: observe that –

Distortion prevention/control measures applied in accordance with workplace procedures.

Assessor guide: confirm that –

The procedures for eliminating/reducing distortion can be given.

Element 5.41A.5 Spray weld material**Criteria 5.41A.5.1**

Deposit spray weld correctly to specification.

Assessor guide: observe that –

Spray weld deposited in accordance with workplace procedures.

Assessor guide: confirm that –

The procedures for depositing spray welds can be identified.

Element 5.41A.6 Inspect spray weld**Criteria 5.41A.6.1**

Visually inspect weld area/joints against specification.

Assessor guide: observe that –

Weld areas/joints visually inspected in accordance with workplace procedures.

Assessor guide: confirm that –

The procedures for visually inspecting weld areas/joints can be identified.

Criteria 5.41A.6.2

Remove defects detected with minimum loss of sound material.

Assessor guide: observe that –

Defects removed with minimum sound material loss in accordance with workplace procedures.

Assessor guide: confirm that –

The reasons for removing defective material with minimal sound material loss can be given.

Range statement

This unit covers powder spraying using hot and/or cold process, on a range of heavy or light materials. Powders are fed into the oxyacetylene flame and are deposited onto the surface to be built up or joined. Work is carried out autonomously or within a team environment using predetermined standards of quality, safety, work and welding procedures, and applies to a range of reclamation activities. Spray weld quality would meet the integrity of the work piece, dependent on the performance requirement of the work piece and the spray weld. Consumables (powders) cover a wide range of applications to suit steels, carbon steels, cast iron, etc or non-metallic materials (plastic/nylon) etc. Preparation of materials would include pre-heat, post-heat, set up of jigs, fixtures, clamps etc. Setting includes the correct settings of gas mixtures and flow rates. For remedial action using machining processes other than grinding with grinding wheels (ceramic or other) the appropriate machining units should also be accessed.

Evidence guide**Assessment context**

This unit may be assessed on the job, off the job, or a combination of on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with fuel gas welding or cutting, or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 5.42A A Perform welds to code standards using flux core arc welding process

Band – Specialisation band A

Field – Fabrication

Unit Weight 6

Pre-requisite units - Path 1

5.7A Manual heating and thermal cutting

5.47A Weld using flux core arc welding process

5.48A Perform advanced welding using flux core arc welding process

5.50A Perform routine gas metal arc welding

9.2A Interpret technical drawing

18.1A Use hand tools

18.2A Use power tools/hand held operations

Element 5.42A.1 Maintain welding equipment

Criteria 5.42A.1.1

Routine maintenance is performed on welding equipment.

Assessor guide: observe that –

Welding equipment including handpiece, cable, lead etc checked and serviceability determined.
Ventilation/extraction equipment checked and determined to be working satisfactorily. Repairs if undertaken as required.

Assessor guide: confirm that –

Maintenance requirements for handpiece, cable, leads can be given.

Element 5.42A.2 Prepare welding materials and equipment for FCAW welding to code standard

Criteria 5.42A.2.1

Weld requirements for welding to code standards are determined.

Assessor guide: observe that –

Weld outcomes, consumables and settings are determined from welding procedure specification.

Assessor guide: confirm that –

Weld requirements of the nominated code can be given, including required weld size, bead placement, weld shape and reinforcement consumables and settings can be selected to suit code requirements.

Criteria 5.42A.2.2

Materials are prepared to produce weld to code standard.

Assessor guide: observe that –

Weld outcomes, consumables and settings are determined from welding procedure specification. Materials are suitably prepared ready for welding.

Assessor guide: confirm that –

Methods for preparing materials for code standard welding can be given. Pre and post welding heating methods and requirements for welds to code standard can be given.

Criteria 5.42A.2.3

Welding equipment is set up.

Assessor guide: observe that –

Equipment consumables and settings are selected as per welding procedure specification.

Assessor guide: confirm that –

Equipment consumables and settings appropriate to code standard welding in relevant situations can be given.

Element 5.42A.3 Weld joints using FCAW to procedure specifications**Criteria 5.42A.3.1**

Materials welded as per weld procedure specification.

Assessor guide: observe that –

Welds are produced to procedure specification. Weld size, bead placement, weld shape and reinforcement, etc are in accordance with weld procedure specification. Distortion prevention techniques are used. The welded joint is cleaned using appropriate tools and technique.

Assessor guide: confirm that –

Weld size, bead placement, weld shape and reinforcement, etc can be assessed against requirements of the nominated code.

Element 5.42A.4 Ensure weld quality**Criteria 5.42A.4.1**

Discontinuities are rectified to ensure conformance to code requirements.

Assessor guide: observe that –

Welded joints are visually inspected for conformity using appropriate techniques. Where discontinuities are identified as a defect, the defect is repaired. The weld conforms to code requirements.

Assessor guide: confirm that –

Techniques for inspecting welds, rectifying defects to code standard can be given.

Criteria 5.42A.4.2

Weld records maintained in accordance with standard operating procedures.

Assessor guide: observe that –

Weld records are accurately completed in accordance with standard operating procedures.

Assessor guide: confirm that –

Requirements for maintaining weld records to code standard can be given.

Range statement

FCAW to code standard carried out using a range of materials. The person would work autonomously or in a team environment using predetermined standards of quality, safety and welding procedures. Butt and fillet welds are produced in all positions. Preparation of materials may include preheating, setting up of jigs, fixtures, clamps, etc. Materials used may include carbon/manganese steel, low alloy steel etc. on plate, pipe and rolled steel sections. Welds produced to the standard of this unit would typically conform to Australian Standard 1210, AS 4140, American Society of Mechanical Engineers (ASME) IX or equivalent. This unit, in conjunction with Unit 5.26 A (Apply welding principles), may satisfy the requirements of AS 1796 Certificate 8F Where advanced manual thermal cutting, gouging and shaping is carried out, Unit (5.8A Advanced manual thermal cutting, gouging and shaping) should also be selected.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with flux core arc welding or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for an off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable time frames relating to typical workplace activities.

Unit MEM 5.43A A Perform welds to code standards using gas metal arc welding process

Band – Specialisation band A

Field – Fabrication

Unit Weight 6

Pre-requisite units - Path 1

5.7A Manual heating and thermal cutting

5.17A Weld using gas metal arc welding process

5.18A Perform advanced welding using gas metal arc welding process

5.50A Perform routine gas metal arc welding

9.2A Interpret technical drawing

18.1A Use hand tools

18.2A Use power tools/hand held operations

Element 5.43A.1 Maintain welding equipment

Criteria 5.43A.1.1

Routine maintenance is performed on welding equipment.

Assessor guide: observe that –

Welding equipment including welding gun, cable, lead etc checked and serviceability determined.
Ventilation/extraction equipment checked and determined to be working satisfactorily. Repairs if undertaken as required.

Assessor guide: confirm that –

Maintenance requirements for welding gun, cable, leads can be given.

Element 5.43A.2 Prepare welding materials and equipment for GMAW welding to code standard

Criteria 5.43A.2.1

Weld requirements for GMAW welding to code standards are determined.

Assessor guide: observe that –

Weld outcomes, consumables and settings are determined from welding procedure specification.

Assessor guide: confirm that –

Weld requirements of the nominated code can be given, including requirement weld size, bead placement, weld shape and reinforcement consumables and settings can be selected to suit code requirements.

Criteria 5.43A.2.2

Materials are prepared to produce weld to code standard.

Assessor guide: observe that –

Weld outcomes, consumables and settings are determined from welding procedure specification. Materials are suitably prepared ready for welding.

Assessor guide: confirm that –

Methods for preparing materials for code standard welding can be given. Pre and post welding heating methods and requirements for welds to code standard can be given.

Criteria 5.43A.2.3

Welding equipment is set up.

Assessor guide: observe that –

Equipment consumables and settings are selected as per welding procedure specification.

Assessor guide: confirm that –

Equipment consumables and settings appropriate to code standard welding in relevant situations can be given.

Element 5.43A.3 Weld joints using GMAW to procedure specifications**Criteria 5.43A.3.1**

Materials welded as per weld procedure specification.

Assessor guide: observe that –

Welds are produced to procedure specification. Weld size, bead placement, weld shape and reinforcement, etc are in accordance with weld procedure specification. Distortion prevention techniques are used. The welded joint is cleaned using appropriate tools and technique.

Assessor guide: confirm that –

Weld size, bead placement, weld shape and reinforcement, etc can be assessed against requirements of the nominated code.

Element 5.43A.4 Ensure weld quality**Criteria 5.43A.4.1**

Discontinuities are rectified to ensure conformance to code requirements.

Assessor guide: observe that –

Welded joints are visually inspected for conformity using appropriate techniques. Where discontinuities are identified as a defect, the defect is repaired. The weld conforms to code requirements.

Assessor guide: confirm that –

Techniques for inspecting welds, rectifying defects to code standard can be given.

Criteria 5.43A.4.2

Weld records maintained in accordance with standard operating procedures.

Assessor guide: observe that –

Weld records are accurately completed in accordance with standard operating procedures.

Assessor guide: confirm that –

Requirements for maintaining weld records to code standard can be given.

Range statement

GMAW to code standard carried out using a range of materials. The person would work autonomously or in a team environment using predetermined standards of quality, safety and welding procedures. Butt and fillet welds are produced in the flat, horizontal, vertical and overhead positions. Preparation of materials may include preheating, setting up of jigs, fixtures, clamps, etc. Materials used may include carbon/manganese steel, low alloy steel and aluminium materials, etc. on plate, pipe and rolled steel sections. Welds produced to the standard of this unit would typically conform to Australian Standard 1210, AS 4140, American Society of Mechanical Engineers (ASME) IX or equivalent. This unit, in conjunction with Unit 5.26 A Apply welding principles, may satisfy the requirements of AS 1796 Certificate 8G. Where advanced manual thermal cutting, gouging and shaping is carried out, Unit 5.8A (Advanced manual thermal cutting, gouging and shaping) should also be selected.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with gas metal arc welding or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for an off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable time frames relating to typical workplace activities.

Unit MEM 5.44A A Perform welds to code standards using gas tungsten arc welding process

Band – Specialisation band A

Field – Fabrication

Unit Weight 6

Pre-requisite units - Path 1

5.7A Manual heating and thermal cutting

5.19A Weld using gas tungsten arc welding process

5.20A Perform advanced welding using gas tungsten arc welding process

5.49A Perform routine gas tungsten arc welding

9.2A Interpret technical drawing

18.1A Use hand tools

18.2A Use power tools/hand held operations

Element 5.44A.1 Maintain welding equipment

Criteria 5.44A.1.1

Routine maintenance is performed on welding equipment.

Assessor guide: observe that –

Welding equipment including handpiece, cable, lead etc checked and serviceability determined.
Ventilation/extraction equipment checked and determined to be working satisfactorily.

Assessor guide: confirm that –

Maintenance requirements for handpiece, cable, leads can be given.

Element 5.44A.2 Prepare welding materials and equipment for GTAW welding to code standard

Criteria 5.44A.2.1

Weld requirements for GTAW welding to code standards are determined.

Assessor guide: observe that –

Weld outcomes, consumables and settings are determined from welding procedure specification.

Assessor guide: confirm that –

Weld requirements of the nominated code can be given, including required weld size, bead placement, weld shape and reinforcement consumables and settings can be selected to suit code requirements.

Criteria 5.44A.2.2

Materials are prepared to produce weld to code standard.

Assessor guide: observe that –

Weld outcomes, consumables and settings are determined from welding procedure specification. Materials are suitably prepared ready for welding.

Assessor guide: confirm that –

Methods for preparing materials for code standard welding can be given. Pre and post welding heating methods and requirements for welds to code standard can be given.

Criteria 5.44A.2.3

Welding equipment is set up.

Assessor guide: observe that –

Equipment consumables and settings are selected as per welding procedure specification.

Assessor guide: confirm that –

Equipment consumables and settings appropriate to code standard welding in relevant situations can be given.

Element 5.44A.3 Weld joints using GTAW to procedure specifications**Criteria 5.44A.3.1**

Materials welded as per weld procedure specification.

Assessor guide: observe that –

Welds are produced to procedure specification. Weld size, bead placement, weld shape and reinforcement, etc are in accordance with weld procedure specification. Distortion prevention techniques are used. The welded joint is cleaned using appropriate tools and technique.

Assessor guide: confirm that –

Weld size, bead placement, weld shape and reinforcement, etc can be assessed against requirements of the nominated code.

Element 5.44A.4 Ensure weld quality**Criteria 5.44A.4.1**

Discontinuities are rectified to ensure conformance to code requirements.

Assessor guide: observe that –

Welded joints are visually inspected for conformity using appropriate techniques. Where discontinuities are identified as a defect, the defect is repaired. The weld conforms to code requirements.

Assessor guide: confirm that –

Techniques for inspecting welds, rectifying defects to code standard can be given.

Criteria 5.44A.4.2

Weld records maintained in accordance with standard operating procedures.

Assessor guide: observe that –

Weld records are accurately completed in accordance with standard operating procedures.

Assessor guide: confirm that –

Requirements for maintaining weld records to code standard can be given.

Range statement

GTAW to code standard carried out using a range of materials. The person would work autonomously or in a team environment using predetermined standards of quality, safety and welding procedures. Butt and fillet welds are produced in the flat, horizontal, vertical and overhead positions. Preparation of materials may include preheating, setting up of jigs, fixtures, clamps, etc. Materials used may include carbon/manganese steel, low alloy steel and aluminium materials, etc. on plate, pipe and rolled steel sections. Welds produced to the standard of this unit would typically conform to Australian Standard 1210, AS 4140, American Society of Mechanical Engineers (ASME) IX or equivalent. This unit, in conjunction with Unit 5.26 A Apply welding principles, may satisfy the requirements of AS 1796 Certificate 7. Where advanced manual thermal cutting, gouging and shaping is carried out, Unit 5.8A (Advanced manual thermal cutting, gouging and shaping) should also be selected.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with gas tungsten arc welding or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for an off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable time frames relating to typical workplace activities.

Unit MEM 5.45A A Perform pipe welds to code standards using manual metal arc welding process

Band – Specialisation band A

Field – Fabrication

Unit Weight 6

Pre-requisite units - Path 1

5.7A Manual heating and thermal cutting

5.12A Perform routine manual metal arc welding

5.15A Weld using manual metal arc welding process

5.16A Perform advanced welding using manual metal arc welding process

9.2A Interpret technical drawing

18.1A Use hand tools

18.2A Use power tools/hand held operations

Element 5.45A.1 Maintain welding equipment

Criteria 5.45A.1.1

Routine maintenance is performed on welding equipment.

Assessor guide: observe that –

Welding equipment including handpiece, cable, lead etc checked and serviceability determined.

Ventilation/extraction equipment checked and determined to be working satisfactorily. Repairs if undertaken as required.

Assessor guide: confirm that –

Maintenance requirements for handpiece, cable, leads can be given.

Element 5.45A.2 Prepare welding materials and equipment for MMAW pipe welding to code standards

Criteria 5.45A.2.1

Weld requirements for welding to code standards are determined.

Assessor guide: observe that –

Weld outcomes, consumables and settings are determined from welding procedure specification.

Assessor guide: confirm that –

Weld requirements of the nominated code can be given, including required weld size, bead placement, weld shape and reinforcement consumables and settings can be selected to suit code requirements.

Criteria 5.45A.2.2

Welding equipment is set up.

Assessor guide: observe that –

Equipment consumables and settings are selected as per welding procedure specification.

Assessor guide: confirm that –

Equipment consumables and settings appropriate to code standard pipe welding in relevant situations can be given.

Criteria 5.45A.2.3

Materials are prepared to produce pipe weld to code standard.

Assessor guide: observe that –

Weld outcomes, consumables and settings are determined from welding procedure specification.
Pipe is suitably prepared ready for welding.

Assessor guide: confirm that –

Methods for preparing pipe for code standard welding can be given. Pre and post welding heating methods and requirements for pipe welding to code standard can be given.

Element 5.45A.3 Weld pipe using MMAW to procedure specifications**Criteria 5.45A.3.1**

Materials welded as per weld procedure specification.

Assessor guide: observe that –

Welds are produced to procedure specification. Weld size, bead placement, weld shape and reinforcement, etc are in accordance with weld procedure specification. Distortion prevention techniques are used. The welded joint is cleaned using appropriate tools and technique.

Assessor guide: confirm that –

Weld size, bead placement, weld shape and reinforcement, etc can be assessed against requirements of the nominated code.

Element 5.45A.4 Ensure weld quality**Criteria 5.45A.4.1**

Discontinuities are rectified to ensure conformance to code requirements.

Assessor guide: observe that –

Welded joints are visually inspected for conformity using appropriate techniques. Where discontinuities are identified as a defect, the defect is repaired. The weld conforms to code requirements.

Assessor guide: confirm that –

Techniques for inspecting pipe welds, rectifying defects to code standard can be given.

Criteria 5.45A.4.2

Weld records maintained in accordance with standard operating procedures.

Assessor guide: observe that –

Weld records are accurately completed in accordance with standard operating procedures.

Assessor guide: confirm that –

Requirements for maintaining weld records to code standard can be given.

Range statement

MMAW to code standard carried out using a range of materials. The person would work autonomously or in a team environment using predetermined standards of quality, safety and welding procedures. Butt and fillet welds are produced on pipe with the axis horizontal, vertical and/or askew. Preparation of materials may include preheating, setting up of jigs, fixtures, clamps, etc. Materials used may include carbon/manganese steel, low alloy steel and aluminium materials, etc. Welds produced to the standard of this unit would typically conform to Australian Standard 1210, AS 4140, American Society of Mechanical Engineers (ASME) IX or equivalent. This unit, in conjunction with Unit 5.26 A (Apply welding principles), may satisfy the requirements of AS 1796 Certificates 2 and 4. Where advanced manual thermal cutting, gouging and shaping is carried out, Unit 5.8A (Advanced manual thermal cutting, gouging and shaping) should also be selected.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with manual metal arc welding or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for an off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable time frames relating to typical workplace activities.

Unit MEM 5.46A A Perform welds to code standards using manual metal arc welding process

Band – Specialisation band A

Field – Fabrication

Unit Weight 6

Pre-requisite units - Path 1

5.7A Manual heating and thermal cutting

5.12A Perform routine manual metal arc welding

5.15A Weld using manual metal arc welding process

5.16A Perform advanced welding using manual metal arc welding process

9.2A Interpret technical drawing

18.1A Use hand tools

18.2A Use power tools/hand held operations

Element 5.46A.1 Maintain welding equipment

Criteria 5.46A.1.1

Routine maintenance is performed on welding equipment.

Assessor guide: observe that –

Welding equipment including handpiece, cable, lead etc checked and serviceability determined.

Ventilation/extraction equipment checked and determined to be working satisfactorily. Repairs if undertaken as required.

Assessor guide: confirm that –

Maintenance requirements for handpiece, cable, leads can be given.

Element 5.46A.2 Prepare welding materials and equipment for MMAW welding to code standard

Criteria 5.46A.2.1

Weld requirements for welding to code standards are determined.

Assessor guide: observe that –

Weld outcomes, consumables and settings are determined from welding procedure specification.

Assessor guide: confirm that –

Weld requirements of the nominated code can be given, including required weld size, bead placement, weld shape and reinforcement consumables and settings can be selected to suit code requirements.

Criteria 5.46A.2.2

Materials are prepared to produce weld to code standard.

Assessor guide: observe that –

Weld outcomes, consumables and settings are determined from welding procedure specification. Materials are suitably prepared ready for welding.

Assessor guide: confirm that –

Methods for preparing materials for code standard welding can be given. Pre and post welding heating methods and requirements for welds to code standard can be given.

Criteria 5.46A.2.3

Welding equipment is set up.

Assessor guide: observe that –

Equipment consumables and settings are selected as per welding procedure specification.

Assessor guide: confirm that –

Equipment consumables and settings appropriate to code standard welding in relevant situations can be given.

Element 5.46A.3 Weld joints using MMAW to procedure specifications**Criteria 5.46A.3.1**

Materials welded as per weld procedure specification.

Assessor guide: observe that –

Welds are produced to procedure specification. Weld size, bead placement, weld shape and reinforcement, etc are in accordance with weld procedure specification. Distortion prevention techniques are used. The welded joint is cleaned using appropriate tools and technique.

Assessor guide: confirm that –

Weld size, bead placement, weld shape and reinforcement, etc can be assessed against requirements of the nominated code

Element 5.46A.4 Ensure weld quality**Criteria 5.46A.4.1**

Discontinuities are rectified to ensure conformance to code requirements.

Assessor guide: observe that –

Welded joints are visually inspected for conformity using appropriate techniques. Where discontinuities are identified as a defect, the defect is repaired. The weld conforms to code requirements.

Assessor guide: confirm that –

Techniques for inspecting welds, rectifying defects to code standard can be given.

Criteria 5.46A.4.2

Weld records maintained in accordance with standard operating procedures.

Assessor guide: observe that –

Weld records are accurately completed in accordance with standard operating procedures.

Assessor guide: confirm that –

Requirements for maintaining weld records to code standard can be given.

Range statement

MMAW to code standard carried out using a range of materials. The person would work autonomously or in a team environment using predetermined standards of quality, safety and welding procedures. Butt and fillet welds are produced in the flat, horizontal, vertical and overhead positions. Preparation of materials may include preheating, setting up of jigs, fixtures, clamps, etc. Materials used may include carbon/manganese steel, low alloy steel and aluminium materials, etc. Welds produced to the standard of this unit would typically conform to Australian Standard 1210, AS 4140, American Society of Mechanical Engineers (ASME) IX or equivalent. This unit, in conjunction with Unit 5.26 A (Apply welding principles), may satisfy the requirements of AS 1796 Certificates 1, 1E, 3 and 3E. Where advanced manual thermal cutting, gouging and shaping is carried out, Unit 5.8A (Advanced manual thermal cutting, gouging and shaping) should also be selected.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with manual metal arc welding or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for an off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable time frames relating to typical workplace activities.

Unit MEM 5.47A A Weld using flux core arc welding process

Band – Specialisation band A

Field – Fabrication

Unit Weight 4

Pre-requisite units - Path 1

5.50A Perform routine gas metal arc welding

18.1A Use hand tools

18.2A Use power tools/hand held operations

Element 5.47A.1 Prepare materials for flux core arc welding

Criteria 5.47A.1.1

Weld requirements identified from specifications and/or drawings.

Assessor guide: observe that –

All appropriate specifications and drawings are obtained.

Assessor guide: confirm that –

The weld requirements for FCAW can be identified.

Criteria 5.47A.1.2

Material is correctly prepared.

Assessor guide: observe that –

Appropriate tools and techniques are used to prepare material for welding in accordance with work site procedures.

Assessor guide: confirm that –

The material preparation requirements can be identified.

Criteria 5.47A.1.3

Materials are assembled/aligned to specification where required.

Assessor guide: observe that –

The materials to be welded are aligned, located and clamped to specifications in accordance with work site procedures.

Assessor guide: confirm that –

Examples of material holding devices and their application can be given. The required relationship between parts to be welded can be identified. The appropriate work holding method for a given application can be identified.

Element 5.47A.2 Select welding machine components**Criteria 5.47A.2.1**

Welding machine settings accessories and consumables identified.

Assessor guide: observe that –

Correct welding machine, settings, gas and electrode for given task selected against pre-determined welding procedures and specifications and/or technical drawings.

Assessor guide: confirm that –

The application of weld metal transfer can be given. The application of a variety of welding machines can be given. The appropriate gas can be identified given the type of electrode, its application and the weld requirements. The electrode classification system can be explained (gas and gasless). The appropriate welding machine for the given task can be identified. Appropriate size of contact tip and drive rollers is given.

Element 5.47A.3 Assemble and set up welding equipment**Criteria 5.47A.3.1**

Welding equipment assembled and set up.

Assessor guide: observe that –

Welding equipment is correctly assembled and set up to safety and work site procedures.

Assessor guide: confirm that –

The relationships between amperage, gas flow, electrode, contact tip and roller, feed rate and material can be given. The appropriate settings for the given applications and the selected equipment/electrodes can be identified.

Element 5.47A.4 Minimise and rectify distortion**Criteria 5.47A.4.1**

Appropriate distortion prevention measures are selected.

Assessor guide: observe that –

Appropriate distortion prevention measures are undertaken during the welding process.

Assessor guide: confirm that –

Methods of preventing distortion of welded materials can be given. The appropriate distortion prevention method for the given application can be identified.

Criteria 5.47A.4.2

Distortion is rectified.

Assessor guide: observe that –

Where appropriate, distortion of welded materials is rectified in accordance with work site procedures.

Assessor guide: confirm that –

Methods of rectifying distortion of welded materials and their applications can be given.

Element 5.47A.5 Weld to job specification using FCAW**Criteria 5.47A.5.1**

Weld deposit is to specification.

Assessor guide: observe that –

Welds are deposited according to job requirements.

Assessor guide: confirm that –

The weld requirements for similar FCAW applications can be identified.

Criteria 5.47A.5.2

Joints cleaned to specifications.

Assessor guide: observe that –

The welded joint is cleaned using appropriate tools and techniques in accordance with work site procedures.

Assessor guide: confirm that –

Methods of cleaning welded joints can be given.

Element 5.47A.6 Ensure weld conformance**Criteria 5.47A.6.1**

Defects removed with minimum loss of sound metal using correct and appropriate techniques and tools.

Assessor guide: observe that –

Where appropriate, weld defects are removed in accordance with work site procedures. A minimum amount of sound metal is removed with the defect.

Assessor guide: confirm that –

Methods of weld defect removal and their application can be given.

Criteria 5.47A.6.2

Weld joints visually inspected for conformance to specifications.

Assessor guide: observe that –

Visual defects in welded joints are identified.

Assessor guide: confirm that –

Weld discontinuities detectable visually can be given.

Element 5.47A.7 Maintain weld records**Criteria 5.47A.7.1**

Weld records are completed correctly.

Assessor guide: observe that –

Weld records are accurately completed in accordance with standard operating procedures.

Assessor guide: confirm that –

The weld records to be kept can be identified. The frequency at which weld details are to be recorded can be identified. The reasons for keeping weld records can be given.

Range statement

FCAW undertaken autonomously or within a team environment using predetermined standards of quality, safety, work and welding procedures and the skills applied to a range of fabrication activities. A range of material suitable to heavy or light fabrication is used. Fillet and butt welds in all positions on common materials. As a guide, welds produced to the standard of this unit would typically conform to Australian Standard 1554 General Purpose, American Bureau of Shipping (ABS) or equivalent. Preparation of materials may include preheating, setting up of jigs, fixtures, clamps, etc. Remedial action using thermal processes may include oxyacetylene and air arc equipment. Grinding devices may also be used. Where thermal processes, hand and/or power tools are required the appropriate specialisation units should be accessed.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the flux core arc welding process or other competencies requiring the exercise of the skills and knowledge covered by this unit.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any drawings, specifications, catalogues, manuals, codes, standards and information relevant to the work. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment, the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities.

Unit MEM 5.48A A Perform advanced welding using flux core arc welding process

Band – Specialisation band A

Field – Fabrication

Unit Weight 4

Pre-requisite units - Path 1

5.7A Manual heating and thermal cutting
9.2A Interpret technical drawing

5.47A Weld using flux core arc welding process
18.1A Use hand tools

5.50A Perform routine gas metal arc welding
18.2A Use power tools/hand held operations

Element 5.48A.1 Prepare welding materials and equipment

Criteria 5.48A.1.1

Welding equipment is prepared.

Assessor guide: observe that –

Appropriate machine settings and electrodes determined from relevant documentation and instructions.

Assessor guide: confirm that –

The elements of a welding procedure can be identified and the purpose given. The purpose of pre and/or post welding heating and the methods of application can be given. The appropriate ventilation/extraction requirements can be identified.

Criteria 5.48A.1.2

Appropriate welding equipment is assembled and adjusted correctly and safely.

Assessor guide: observe that –

Welding equipment is set up safely with correct settings in accordance with standard operating procedures.

Assessor guide: confirm that –

Settings, electrodes and related equipment set-up can be given for materials and weld requirements. The purpose for the correct size of welding cable, handpiece and equipment capacity is given. The purpose for the replacing worn liners, drive rolls, contact tip and gas shrouds is given. The purpose of changing welding current polarity is given.

Criteria 5.48A.1.3

Materials are prepared to achieve required weld specification.

Assessor guide: observe that –

Weld and material preparation requirements are identified from given specifications. Materials are prepared correctly, using appropriate tools and techniques.

Assessor guide: confirm that –

All weld and preparation requirements to achieve code specification can be given.

Element 5.48A.2 Weld joints to code requirements using FCAW**Criteria 5.48A.2.1**

Weld requirements are interpreted correctly.

Assessor guide: observe that –

Instructions, symbols, specifications interpreted correctly, including bead size, bead placement, reinforcement, etc., and in accordance with weld procedure sheet, if available, and standard operating procedures.

Assessor guide: confirm that –

The weld requirements of nominated code can be identified. The location and size of the weld(s) to be deposited can be identified.

Criteria 5.48A.2.2

Welds are deposited correctly to specifications.

Assessor guide: observe that –

Fillet and butt welds are deposited correctly as per code requirements. Where appropriate, distortion prevention techniques are used in accordance with work site procedures. The welded joint is cleaned using appropriate tools and techniques in accordance with work site procedures.

Assessor guide: confirm that –

Methods and conditions for obtaining fillet and butt weld deposits to code requirements can be given. Distortion prevention techniques can be given.

Element 5.48A.3 Assess weld quality and rectify faults**Criteria 5.48A.3.1**

Weld joints visually inspected against specifications.

Assessor guide: observe that –

Weld are inspected against the nominated code and discontinuities identified. Decision is made as to acceptability of discontinuity as per code requirements.

Assessor guide: confirm that –

Various weld discontinuities that are detectable visually and do not conform to the code requirements can be explained. The causes of the discontinuities are given.

Criteria 5.48A.3.2

Discontinuities are removed using appropriate methods.

Assessor guide: observe that –

Where identified and does not meet code requirements, discontinuities are removed. A minimum amount of sound metal is removed with the defect. The weld conforms to the requirements of the job specification.

Assessor guide: confirm that –

Discontinuities can be identified in relation to code requirements.

Criteria 5.48A.3.3

Weld records are correctly completed and maintained.

Assessor guide: observe that –

Weld identification is applied appropriately and documentation completed correctly.

Assessor guide: confirm that –

Different welder identification systems can be given, such as numbering, bar coding, paint coding, letter stamps.

Range statement

Advanced FCAW undertaken autonomously or in a team environment using predetermined standards of quality, safety and welding procedures. Work is carried out on a range of structural sections and/or plate and/or pipe for general fabrication and may include low carbon steel, stainless steel, low alloy steel, etc. As a guide, welds produced to the standard of this unit would typically conform to Australian Standard 1554 Structural Purpose, Bureau Det Norse Verticas or equivalent. Welds would be fillet and butt in all positions. Preparation of materials may include preheating, setting up of jigs, fixtures, clamps, etc.

Evidence guide**Assessment context**

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the flux core arc welding process or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 5.49A B Perform routine gas tungsten arc welding

Band – Specialisation band A

Field – Fabrication

Unit Weight 2

This unit covers the competencies required for identifying welding requirements from instructions, preparing the materials and carrying out routine GTAW . This unit applies in a maintenance or manufacturing environment where the welding is not required to meet the Australian Standard 1554 General Purpose. The materials used would typically be low carbon and mild steels.

Element 5.49A.1 Identify weld requirements

Criteria 5.49A.1.1

Weld requirements are identified from job instructions.

Assessor guide: observe that –

Appropriate instructions, specifications and drawings are obtained and weld requirements identified in accordance with work site procedures.

Assessor guide: confirm that –

The weld requirements for performing routine GTAW can be given.

Criteria 5.49A.1.2

Location of welds are identified in accordance with standard operating procedures and job specifications.

Assessor guide: observe that –

Location of required weld/s identified for given tasks.

Assessor guide: confirm that –

Location of weld can be determined from standard operating procedures and job specifications.

Element 5.49A.2 Prepare materials for welding

Criteria 5.49A.2.1

Materials are cleaned and prepared ready for welding.

Assessor guide: observe that –

The materials to be welded are cleaned and prepared using appropriate tools and techniques.

Assessor guide: confirm that –

The materials preparation required prior to welding can be identified. The tools and techniques appropriate to the preparation of materials to be welded can be identified.

Element 5.49A.3 Prepare equipment for welding

Criteria 5.49A.3.1

Welding equipment is set up correctly.

Assessor guide: observe that –

The welding leads, gas regulators and hoses are correctly attached. Correct electrode and gas types for current use are selected.

Assessor guide: confirm that –

Different current types and examples of application can be given. Machine controls and their functions can be identified and explained.

Criteria 5.49A.3.2

Settings and consumables are selected to suit application.

Assessor guide: observe that –

Correct gas flow rate is set. The welding machine is set for the electrode diameter to produce the weld required. The range of variables is appropriate for the weld required. Appropriate current range for electrode diameter is set.

Assessor guide: confirm that –

Different current settings for electrode diameter and current types can be given.

Element 5.49A.4 Perform routine welding using GTAW**Criteria 5.49A.4.1**

Safe welding practices are applied.

Assessor guide: observe that –

All welds are performed in a safe manner with regard to the operator and other personnel. Precautions are taken to protect the welder and other personnel from hazards associated with welding process.

Assessor guide: confirm that –

Safe welding practices and precautions can be given. Typical hazards can be identified.

Criteria 5.49A.4.2

Materials are welded to job requirements.

Assessor guide: observe that –

Welds are produced with a minimum number of major defects. Appropriate action taken to report defects. Cause of major defects identified and required adjustments to settings/ welding technique identified.

Assessor guide: confirm that –

Major defects and their causes relating to GTAW can be given.

Criteria 5.49A.4.3

Welds cleaned in accordance with standard operating procedures.

Assessor guide: observe that –

All welds are cleaned to specification. Standard operating procedures are followed, where applicable.

Assessor guide: confirm that –

The weld cleaning requirements can be identified. The appropriate tools/equipment for cleaning welds can be identified.

Range statement

Routine GTAW in this unit is intended to apply in a manufacturing or maintenance environment where welding is not required to meet Australian Standards or other welding codes, Occupational Health and Safety regulations relating to certificated/coded welding and/or licensing requirements. Fillet and butt welds in all positions would typically be performed on low carbon/mild steels. Weld preparation would be minimal and generally restricted to cleaning, using files and grinders. In circumstances where welding is required to meet Australian Standard 1554 General Purpose or equivalent codes, Occupational Health and Safety regulations and/or licensing requirements Unit 5.19A (Weld using gas tungsten arc welding process) should be selected.

Evidence guide**Assessment context**

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with routine gas tungsten arc welding or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference manuals. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable time frames relating to typical workplace activities.

Unit MEM 5.50A A Perform routine gas metal arc welding

Band – Specialisation band A

Field – Fabrication

Unit Weight 2

Element 5.50A.1 Identify weld requirements

Criteria 5.50A.1.1

Weld requirements are identified from job instructions.

Assessor guide: observe that –

Appropriate instructions, specifications and drawings are obtained and weld requirements identified in accordance with work site procedures.

Assessor guide: confirm that –

The weld requirements for performing routine GMAW can be given.

Criteria 5.50A.1.2

Location of welds are identified in accordance with standard operating procedures and job specifications.

Assessor guide: observe that –

Location of required weld/s identified for given tasks.

Assessor guide: confirm that –

Location of weld can be determined from standard operating procedures and job specifications.

Element 5.50A.2 Prepare materials for welding

Criteria 5.50A.2.1

Materials are cleaned and prepared ready for welding.

Assessor guide: observe that –

The materials to be welded are cleaned and prepared using appropriate tools and techniques.

Assessor guide: confirm that –

The materials preparation required prior to welding can be identified. The tools and techniques appropriate to the preparation of materials to be welded can be identified.

Element 5.50A.3 Prepare equipment for welding

Criteria 5.50A.3.1

Welding equipment is set up correctly.

Assessor guide: observe that –

The welding leads, gas regulators and hoses are correctly attached. Clean and correct liner and contact tip selected.

Assessor guide: confirm that –

Different liners and tips can be given to suit typical situations. Machine controls and their functions can be identified and explained.

Criteria 5.50A.3.2

Settings and consumables are selected to suit

Assessor guide: observe that –

Correct gas flow rate is set. The welding machine is set for the electrode wire diameter to produce the weld required. The range of variables is appropriate for the weld required. Appropriate current and voltage range for the weld required are set.

Assessor guide: confirm that –

Different current & voltage settings, gas flow rates wire diameters and other variables can be given to suit typical situations.

Element 5.50A.4 Perform routine welding using GMAW**Criteria 5.50A.4.1**

Safe welding practices are applied.

Assessor guide: observe that –

All welds are performed in a safe manner with regard to the operator and other personnel. Precautions are taken to protect the welder and other personnel from hazards associated with welding process.

Assessor guide: confirm that –

Safe welding practices and precautions can be given. Typical hazards can be identified.

Criteria 5.50A.4.2

Materials are welded to job requirements.

Assessor guide: observe that –

Welds are produced with a minimum number of major defects. Appropriate action taken to report defects. Cause of major defects identified and required adjustments to settings/ welding technique identified.

Assessor guide: confirm that –

Major defects and their causes relating to GMAW can be given.

Criteria 5.50A.4.3

Welds cleaned in accordance with standard operating procedures.

Assessor guide: observe that –

All welds are cleaned to specification. Standard operating procedures are followed, where applicable.

Assessor guide: confirm that –

The weld cleaning requirements can be identified. The appropriate tools/equipment for cleaning welds can be identified.

Range statement

Routine GMAW in this unit is intended to apply in a manufacturing or maintenance environment where welding is not required to meet Australian Standards or other welding codes, Occupational Health and Safety regulations relating to certificated/coded welding and/or licensing requirements. Fillet and butt welds in all positions would typically be performed on low carbon/mild steels. Weld preparation would be minimal and generally restricted to cleaning, using files and grinders. In circumstances where welding is required to meet Australian Standard 1554 General Purpose or equivalent codes, Occupational Health and Safety regulations and/or licensing requirements Unit 5.17A (Weld using gas metal arc welding process) should be selected.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with routine gas metal arc welding or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference manuals. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable time frames relating to typical workplace activities.

Unit MEM 6.1A A Hand forging

Band – Specialisation band A

Field – Forging

Unit Weight 4

Pre-requisite units - Path 1

18.1A Use hand tools

Element 6.1A.1 Use hand tools and formers

Criteria 6.1A.1.1

Hand tools and formers correctly selected for specific forging techniques.

Assessor guide: observe that –

The relevant job instructions, drawings, procedures etc are obtained in accordance with work place procedures.

Assessor guide: confirm that –

The task(s) to be performed can be identified. The range of hand tools and formers used in hand forging and their application can be identified. The hand tools and formers to be used to produce a variety of given articles can be identified. The reasons for selecting the chosen hand tools and formers can be given. The techniques to be used when hand forging given articles can be described.

Criteria 6.1A.1.2

Hand tools and formers used correctly.

Assessor guide: observe that –

A wide range of hand tools and formers are used correctly in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for hand forging articles can be given.

Element 6.1A.2 Apply hand forging techniques

Criteria 6.1A.2.1

Knowledge of drawing, swaging, bending, upsetting, spreading, punching and drifting techniques applied to produce articles to specification.

Assessor guide: observe that –

Articles are produced to specification using appropriate hand forging techniques in accordance with standard operating procedures.

Assessor guide: confirm that –

The following hand forging techniques and procedures can be described: - drawing - swaging - bending - upsetting - spreading - punching - drifting. The reasons for selecting the chosen hand forging technique(s) to produce the given article can be explained. The specifications of the article to be produced can be identified.

Criteria 6.1A.2.2

Forging temperatures and heat specifications adhered to for various materials.

Assessor guide: observe that –

The hand forging of articles is carried out at the correct forging temperature and within the heat specifications of the material being forged.

Assessor guide: confirm that –

The source of information on forging temperatures and heat specifications for various materials can be identified. The forging temperatures and heat specifications for a range of materials can be identified.

Criteria 6.1A.2.3

Allowance made for material shrinkage and oxidation.

Assessor guide: observe that –

Appropriate allowance for material shrinkage and oxidation is made when hand forging articles.

Assessor guide: confirm that –

The effects of material shrinkage and oxidation on the dimensions of the forged article can be given. The methods of overcoming/allowing for the effects of shrinkage and oxidation when hand forging articles can be explained.

Criteria 6.1A.2.4

Appropriate forging technique selected and applied.

Assessor guide: observe that –

The appropriate hand forging technique is applied to produce given articles in accordance with standard operating procedures.

Assessor guide: confirm that –

Element 6.1A.3 Operate heating equipment**Criteria 6.1A.3.1**

Heating equipment set up and operated correctly.

Assessor guide: observe that –

The appropriate heating equipment is set up and operated correctly in accordance with standard operating procedures.

Assessor guide: confirm that –

A range of heating equipment and its application can be identified. The procedures for operating each type of heating equipment can be given. The procedures for setting up each type of heating equipment can be given. The most appropriate heating equipment for a given forging task can be identified. The reasons for selecting the chosen heating equipment can be given.

Criteria 6.1A.3.2

Equipment operated in a manner that minimises oxidation.

Assessor guide: observe that –

The heating equipment is operated in a manner that will minimise oxidation of the material to be forged in accordance with standard operating procedures.

Assessor guide: confirm that –

Criteria 6.1A.3.3

Heat controlled to specified areas.

Assessor guide: observe that –

Heat is applied and controlled in specified areas of the material to be forged in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for controlling the application of heat to specified areas of the material to be forged can be given. The reasons for concentrating the heat in specified areas can be explained.

Range statement

This unit refers to the hand forging of low to medium carbon and alloy steels using various techniques, tools, formers and heating devices. Heating devices include diesel, electric and gas furnaces; coke fires and gaseous oxygen/fuel equipment. Work approach is determined using specifications, instructions and drawings. For simple manual heating and bending see Unit 5.7A (Manual heating, thermal cutting and gouging).

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with hand forging or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 6.2A A Hammer forging

Band – Specialisation band A

Field – Forging

Unit Weight 4

Element 6.2A.1 Use hammer tools and formers

Criteria 6.2A.1.1

Hammer tools and formers correctly selected for specific forging technique.

Assessor guide: observe that –

Assessor guide: confirm that –

A wide range of hammer tools and formers and their application can be identified. A variety of hammer forging techniques can be described. The appropriate tools, formers and techniques can be selected to produce a range of hammer forged articles. The reasons for selecting the chosen tools, formers and techniques can be given.

Criteria 6.2A.1.2

Hammer tools and formers used correctly.

Assessor guide: observe that –

The appropriate hammer tools and formers are used correctly to produce given articles in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for hammer forging given articles can be identified.

Criteria 6.2A.1.3

Forging machine set up and operated correctly.

Assessor guide: observe that –

The forging machine is set up and operated in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for setting up and operating forging machines can be given. The tools, equipment and techniques necessary to set up the forging machine can be identified.

Element 6.2A.2 Apply hammer forging techniques

Criteria 6.2A.2.1

Appropriate hammer forging technique selected and applied.

Assessor guide: observe that –

The relevant job instructions, drawings, specifications and procedures are obtained in accordance with workplace procedures. The article is produced to specification using appropriate hammer forging techniques, tools and formers in accordance with standard operating procedures.

Assessor guide: confirm that –

The work to be undertaken can be identified. The specifications of the article to be hammer forged can be identified. The appropriate hammer forging technique, tools and formers can be identified. The reasons for selecting the chosen technique, tools and formers can be explained.

Criteria 6.2A.2.2

Defects recognised and appropriate rectification action taken.

Assessor guide: observe that –

Where appropriate, forging defects are detected and rectified in accordance with standard operating procedures.

Assessor guide: confirm that –

Common defects in hammer forged articles and their causes can be identified. Those defects that can be rectified and the method of rectification of the defect can be given.

Criteria 6.2A.2.3

Correct techniques applied to the handling of hot metal with regard to balancing and pivoting.

Assessor guide: observe that –

The hot metal is handled safely in accordance with standard operating procedures.

Assessor guide: confirm that –

The techniques for handling hot metal with respect to balancing and pivoting can be given. The hazards associated with handling hot metal can be identified. The appropriate personal protective clothing and equipment and its use can be identified. The procedures for handling hot metal can be given.

Criteria 6.2A.2.4

Correct heating procedure applied.

Assessor guide: observe that –

The material being forged is heated correctly in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for heating material to be hammer forged can be given.

Element 6.2A.3 Select material**Criteria 6.2A.3.1**

Material calculations made using volumes and weights that include provision for oxidation and shrinkage.

Assessor guide: observe that –

The volume and weight of material required to produce a given article to specification is correctly calculated in accordance with standard operating procedures.

Assessor guide: confirm that –

The allowances to be made for oxidation and shrinkage of the material to be forged can be given. The reasons for making those allowances can be explained. The procedures and formulae for determining the volume and weight of material required to produce an article to specification can be given.

Criteria 6.2A.3.2

Material correctly selected for use with specific tools and formers.

Assessor guide: observe that –

The appropriate tools and formers for the material to be hammer forged are used in accordance with standard operating procedures.

Assessor guide: confirm that –

The material specifications can be identified. The hammer tools and formers to be used with a variety of different materials can be identified. The reasons for selecting specific tools and formers for use with different materials can be explained.

Range statement

This unit refers to hammer forging operations on carbon and alloy steels using various techniques, tools, formers, power hammers and heating devices. Heating devices include diesel, electric and gas furnaces; coke fires and gaseous oxygen/fuel equipment. Work approach is determined using specifications, instructions and drawings. Equipment range does not include drop and upset machinery, vacuum furnaces or rolling and extruding mill machinery.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with hammer forging or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 6.3A B Carry out heat treatment

Band – Specialisation band A

Field – Forging

Unit Weight 6

Element 6.3A.1 Determine requirements of job

Criteria 6.3A.1.1

Job requirements determined from engineering drawings, job sheet or verbal instructions from metallurgist or supervisor.

Assessor guide: observe that –

Job instructions, drawings and specifications obtained in accordance with work site procedures.

Assessor guide: confirm that –

The work to be undertaken can be identified. The specifications pertaining to the work to be done can be identified.

Element 6.3A.2 Select heat treatment equipment

Criteria 6.3A.2.1

Appropriate equipment for heat treatment application selected.

Assessor guide: observe that –

Assessor guide: confirm that –

The equipment to be used with a variety of heat treatment applications can be identified. The most appropriate equipment to carry out the required heat treatment process can be identified.

Element 6.3A.3 Set up equipment

Criteria 6.3A.3.1

Equipment set up according to standard operating procedures and manufacturer's instructions.

Assessor guide: observe that –

The appropriate equipment is correctly set up for the required heat treatment process in accordance with standard operating procedures and manufacturer's instructions.

Assessor guide: confirm that –

Element 6.3A.4 Work safely with hot metals**Criteria 6.3A.4.1**

Appropriate safety clothing and personal protection equipment used correctly as specified in standard operating procedures.

Assessor guide: observe that –

Appropriate safety clothing and personal protection equipment is used in accordance with standard operating procedures.

Assessor guide: confirm that –

The hazards associated with the heat treatment process can be identified. The safety clothing and personal protection equipment to be worn can be identified.

Criteria 6.3A.4.2

Emergency procedures identified and demonstrated according to approved safety instructions.

Assessor guide: observe that –

Emergency procedures can be correctly demonstrated.

Assessor guide: confirm that –

Emergency procedures to be followed in the event of an emergency can be identified.

Criteria 6.3A.4.3

Safety signs and symbols identified and understood.

Assessor guide: observe that –

Assessor guide: confirm that –

The meaning of all safety signs and symbols can be given.

Criteria 6.3A.4.4

Equipment used according to specifications and standard operating procedures.

Assessor guide: observe that –

Standard operating procedures and specifications are followed at all times during the heat treatment process.

Assessor guide: confirm that –

The standard operating procedures for the heat treatment process(es) can be identified.

Element 6.3A.5 Heat treat material**Criteria 6.3A.5.1**

Material is treated to achieve required result and may include processes of preparation eg: coatings and packings; preheating; soaking; quenching; tempering; annealing; normalising; carburizing; sintering.

Assessor guide: observe that –

The required heat treatment process(es) are carried out in accordance with standard operating procedures.

Assessor guide: confirm that –

The heat treatment process to be carried out can be identified. The preparation requirements of the material to be heat treated can be identified. The quenching requirements of the material to be heat treated can be identified. The preheating requirements of the material to be heat treated can be identified. The condition of the material to be achieved via the heat treating process can be identified.

Criteria 6.3A.5.2

Material piece or batch loaded and unloaded using equipment appropriate to the situation in accordance with standard operating procedures.

Assessor guide: observe that –

The furnace is loaded safely in accordance with standard operating procedures.

Assessor guide: confirm that –

The equipment to be used in batch and/or piece loading of furnaces can be identified. The procedures for the safe loading of furnaces can be identified.

Criteria 6.3A.5.3

Correct temperature is maintained in accordance with standard operating procedures.

Assessor guide: observe that –

The correct temperature is maintained in accordance with specifications and standard operating procedures.

Assessor guide: confirm that –

The temperature applicable to the heat treatment process can be identified. The time for which the temperature must be maintained can be identified.

Element 6.3A.6 Identify hazardous conditions**Criteria 6.3A.6.1**

Hazards identified and planning undertaken to maintain a safe work environment.

Assessor guide: observe that –

All work is undertaken safely in accordance with standard operating procedures. Where appropriate, hazards are reported to the appropriate person.

Assessor guide: confirm that –

The hazards associated with working in a heat treatment environment can be identified. The precautions to be undertaken to ensure a safe working environment is maintained can be identified. The procedures for reporting identified hazards can be given.

Range statement

This unit applies to heat treatment of ferrous and non-ferrous metals. Equipment range may include salt baths, vacuum furnace, induction heating, kilns, gas fired furnaces, etc. and may incorporate overhead lifting apparatus. Simple heat treatment applications like annealing and/or heat/quench processes undertaken as incidental to trade work eg. toolmaking are covered by Unit 6.7A (Perform heat/quenching, tempering and annealing).

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the carrying out of heat treatment processes or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 6.4A A Select heat treatment processes and test finished product

Band – Specialisation band A

Field – Forging

Unit Weight 6

Pre-requisite units - Path 1

6.3A Carry out heat treatment

Element 6.4A.1 Determine requirements of job

Criteria 6.4A.1.1

Process to achieve specified result determined using reference material, metallurgist's report, consultation or technical specialists or other appropriate personnel.

Assessor guide: observe that –

All relevant information is obtained in accordance with workplace procedures.

Assessor guide: confirm that –

The characteristics of the material to be achieved through heat treatment of the material can be identified. The sources of information on material characteristics, heat treatment processes and equipment can be identified.

Criteria 6.4A.1.2

Knowledge of metal composition and effects of heat and cooling applied to selection of appropriate process.

Assessor guide: observe that –

Assessor guide: confirm that –

Six heat treatment processes can be identified. The effect on material characteristics of the heat treatment processes identified can be given. The appropriate heat treatment process to achieve the required material characteristics can be identified. For the material characteristics to be achieved via the selected heat treatment process the following can be identified: - any material preparation requirements - any quenching requirements - any preheating requirements - the temperature to be achieved - the time for which the temperature is to be maintained. The effect of variations in material composition on the above parameters can be identified.

Element 6.4A.2 Maintain documentation of jobs**Criteria 6.4A.2.1**

All relevant information recorded in accordance with standard operating procedures.

Assessor guide: observe that –

All relevant information on material characteristics is recorded in accordance with standard operating procedures.

Assessor guide: confirm that –

The material characteristics to be recorded and the frequency at which they are to be recorded can be identified.

Criteria 6.4A.2.2

Information relating to heat treatment equipment and processes recorded and kept up to date as required.

Assessor guide: observe that –

All relevant information relating to the heat treatment equipment and its use is recorded in accordance with standard operating procedures.

Assessor guide: confirm that –

The data relating to equipment usage to be recorded and the frequency of recording can be identified.

Element 6.4A.3 Test material**Criteria 6.4A.3.1**

Material prepared for testing as required.

Assessor guide: observe that –

Where appropriate, materials are appropriately prepared for testing in accordance with standard operating procedures.

Assessor guide: confirm that –

The types of destructive testing and their application can be given. The types of non-destructive testing and their application can be given. The material preparation requirements for each test can be identified.

Criteria 6.4A.3.2

Properties of material tested using appropriate testing equipment as required.

Assessor guide: observe that –

Where appropriate, the physical properties of the heat treated materials are tested using the appropriate equipment in accordance with standard operating procedures.

Assessor guide: confirm that –

The physical properties of materials that are to be tested can be identified. The equipment to be used in determining each of the physical properties of material can be identified. The appropriate tests and equipment for the work to be undertaken can be identified.

Criteria 6.4A.3.3

Heat treatment faults identified and reported if appropriate.

Assessor guide: observe that –

Where appropriate, heat treatment faults are identified. Where appropriate, heat treatment faults are reported in accordance with standard operating procedures.

Assessor guide: confirm that –

Common heat treatment faults can be identified. The procedures to be followed if heat treatment faults are detected can be identified.

Criteria 6.4A.3.4

Heat treatment faults rectified where possible.

Assessor guide: observe that –

Where appropriate, heat treatment faults are rectified in accordance with standard operating procedures.

Assessor guide: confirm that –

Heat treatment faults that can be rectified can be identified. The procedures for rectifying those faults can be given.

Range statement

This unit applies to heat treatment of ferrous and non-ferrous metals. Equipment range may include salt baths, vacuum furnace, induction heating, kilns, gas fired furnaces etc. and may incorporate overhead lifting equipment. Advice may be given as to selection of appropriate material to provide required product outcome. Testing may include destructive and non-destructive testing methods.

Evidence guide**Assessment context**

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the selection of heat treatment processes and/or the testing of heat treated products or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 6.5A A Drop and upset forging

Band – Specialisation band A

Field – Forging

Unit Weight 4

Pre-requisite units - Path 1

6.2A Hammer forging

Element 6.5A.1 Identify and select drop and upset forging equipment and tools for specific operation

Criteria 6.5A.1.1

Appropriate equipment selected which accounts for size of material and procedures.

Assessor guide: observe that –

The relevant job instructions, drawings, specifications and procedures are obtained in accordance with workplace procedures.

Assessor guide: confirm that –

The work to be undertaken can be identified. The specifications of the work to be done can be identified. The drop or upset forging procedures to be used to carry out the specific operations required can be given. The appropriate drop/upset forging equipment to be used to carry out the work can be identified. The reasons for selecting the chosen equipment can be given.

Criteria 6.5A.1.2

Dies and punches correctly selected for specific operations and equipment.

Assessor guide: observe that –

Assessor guide: confirm that –

The dies and punches required to carry out the specific operations required in the selected equipment can be identified. The reasons for selecting the chosen dies and punches can be given.

Criteria 6.5A.1.3

Die replacement correctly determined with regard to relief allowances, cracking, dimensions, etc.

Assessor guide: observe that –

The die is inspected for defects and conformance to specifications in accordance with standard operating procedures. Where appropriate, the die is replaced in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for checking dies for defects/conformance to specification can be given. The tools, techniques and equipment required to inspect dies can be identified. The procedures for replacing defective/out of specification dies can be given. The tools, techniques and equipment required to replace dies can be identified.

Element 6.5A.2 Set up and operate drop and upset forging equipment**Criteria 6.5A.2.1**

Equipment correctly and safely set up, adjusted and operated.

Assessor guide: observe that –

The drop/upset forging equipment is safely set up, adjusted and operated in accordance with standard operating procedures.

Assessor guide: confirm that –

The safety precautions to be taken when setting, adjusting and operating forging equipment can be identified. The procedures for setting, adjusting and operating forging equipment can be given. The tools, techniques and equipment required to set and adjust forging equipment can be identified.

Criteria 6.5A.2.2

Correct die setting techniques applied in setting correct die and punch alignment.

Assessor guide: observe that –

The dies and punches are correctly aligned in accordance with specifications and standard operating procedures.

Assessor guide: confirm that –

The consequences of incorrect alignment of dies and punches can be identified. The procedures for ensuring correct alignment of dies and punches can be given.

Criteria 6.5A.2.3

Correct die preheating procedures applied.

Assessor guide: observe that –

The die is preheated to the correct temperature in accordance with standard operating procedures.

Assessor guide: confirm that –

The reasons for preheating the dies can be given. The procedures for preheating dies can be given. The temperature to which the die is to be preheated for the specific operation can be identified.

Element 6.5A.3 Prepare material**Criteria 6.5A.3.1**

Materials correctly prepared and heated in accordance with job requirements and/or specifications.

Assessor guide: observe that –

The material to be forged is correctly prepared and heated in accordance with specifications and standard operating procedures.

Assessor guide: confirm that –

The material to be forged can be identified. The preparation and heating requirements of the material can be identified. The source of preparation and heating requirements of different materials can be identified. The procedures for preparing and heating the material to be forged can be given.

Element 6.5A.4 Drop and upset forge material**Criteria 6.5A.4.1**

Drop forge material using correct procedures and techniques.

Assessor guide: observe that –

The material is drop/upset forged to specification in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures and techniques for drop/upset forging of material can be given.

Criteria 6.5A.4.2

Correct lubricant applied for die wear and forging release.

Assessor guide: observe that –

The appropriate lubricant is applied to the die in accordance with standard operating procedures.

Assessor guide: confirm that –

The reasons for lubricating the die can be given. The procedures for lubricating the die can be given. The appropriate lubricant for the die/material being forged can be identified.

Criteria 6.5A.4.3

Correct grain flow determined.

Assessor guide: observe that –

Assessor guide: confirm that –

The grain flow to be achieved in the forging can be identified. The consequences of grain flow not conforming to specifications can be given.

Criteria 6.5A.4.4

Galls, folds and cracks identified and corrected.

Assessor guide: observe that –

Where appropriate, galls, folds and cracks in drop/upset forged articles are identified and corrected in accordance with standard operating procedures.

Assessor guide: confirm that –

The causes of galls, folds and cracks in drop/upset forged articles can be identified. The procedures for correcting defects in drop/upset forged articles can be given.

Criteria 6.5A.4.5

Correct removal of flash or fin.

Assessor guide: observe that –

Where appropriate, flash or fins are removed from drop/upset forged articles in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for removing flash and fins from drop/upset forged articles can be given. The tools, techniques and equipment required to remove flash and fins can be identified.

Criteria 6.5A.4.6

Material amounts calculated with allowance for heat wastage and flash or fin.

Assessor guide: observe that –

The weight and volume of material required to produce a specific article by drop/upset forging is correctly calculated in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures and formulae for calculating material volume and weight to produce the specified forging can be given. The source of data on allowances to be made for different materials can be identified. The reasons for making allowances for heat wastage, flash and fin can be explained.

Range statement

This unit refers to drop and upset forging operations conducted on a range of metals. Material forged is to specified dimensional accuracy and finish. Equipment range includes drop forging and upset forging equipment and cold upset forging equipment. For routine, repetitive cold upset forging see Unit 7.24A (Operate and monitor machine/process).

Evidence guide**Assessment context**

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with drop and upset forging or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 6.6A B Spring repair

Band – Specialisation band A

Field – Forging

Unit Weight 4

This unit covers the competencies required to assess the spring condition, set and reset springs for repair, set up and operate spring forming equipment, form and shape material and test components. Materials typically include spring and stainless steels.

Pre-requisite units - Path 1

6.1A Hand forging

6.3A Carry out heat treatment

18.1A Use hand tools

Element 6.6A.1 Assess spring condition

Criteria 6.6A.1.1

Knowledge of annealing, hardening, tempering, soaking, spring operation and setting applied in determining defects and correct action

Assessor guide: observe that –

Springs are checked for correct operation or malfunction in accordance with standard operating procedures

Assessor guide: confirm that –

The procedures for testing springs for correct operation/malfunction can be given The tools, techniques and equipment required to test springs can be identified The specifications of the spring being tested can be determined Deviations of spring performance from specification can be identified The causes of the deviation from specification/defect in the spring can be identified The effects of annealing, hardening, tempering, soaking and setting on spring operation can be identified

Criteria 6.6A.1.2

Springs suitable for rework correctly identified

Assessor guide: observe that –

Springs suitable for rework can be correctly identified from a given sample of springs

Assessor guide: confirm that –

Spring defects that can be rectified by rework can be identified The rework procedures for a range of spring defects can be given

Criteria 6.6A.1.3

Repair procedure correctly identified

Assessor guide: observe that –

Assessor guide: confirm that –

The appropriate repair procedure for given repairable springs can be identified The reasons for selecting the chosen repair procedure can be given

Element 6.6A.2 Set and reset springs for repair

Criteria 6.6A.2.1

Correct stripping procedure applied

Assessor guide: observe that –

Springs for repair are stripped in accordance with standard operating procedures

Assessor guide: confirm that –

The procedures for stripping springs prior to repair can be given The reasons for stripping springs prior to repair can be explained

Criteria 6.6A.2.2 Setting tolerances allowed for in set/reset of springs to specification	<i>Assessor guide: observe that –</i> Springs are set/reset to specification in accordance with standard operating procedures	<i>Assessor guide: confirm that –</i> The setting specifications of the spring to be set/reset can be identified The procedures for setting/resetting springs can be given
Criteria 6.6A.2.3 Correct temperature controlled for setting/resetting springs	<i>Assessor guide: observe that –</i> Springs are set/reset at the correct temperature for the spring material in accordance with standard operating procedures	<i>Assessor guide: confirm that –</i> The temperature at which springs are to be set/reset can be identified The source of information on setting temperatures for different spring materials can be given
Element 6.6A.3 Set up and operate spring forming equipment		
Criteria 6.6A.3.1 Equipment safely set up and correctly utilised	<i>Assessor guide: observe that –</i> Spring forming equipment is safely and correctly set up in accordance with standard operating procedures	<i>Assessor guide: confirm that –</i> The procedures for setting up spring forming equipment can be given The hazards associated with the set up and operation of spring forming equipment can be identified The precautions to be taken when setting up and operating spring forming equipment can be identified
Criteria 6.6A.3.2 Material correctly and safely positioned	<i>Assessor guide: observe that –</i> The material to be formed is safely and correctly positioned in the spring forming equipment in accordance with standard operating procedures	<i>Assessor guide: confirm that –</i> The procedures for positioning material in the spring forming equipment can be given
Criteria 6.6A.3.3 Forming equipment and tools correctly selected and utilised for application	<i>Assessor guide: observe that –</i> The appropriate forming tools and equipment are used to form springs in accordance with specifications and standard operating procedures	<i>Assessor guide: confirm that –</i> The forming equipment and tools for given spring forming applications can be identified The reasons for selecting the chosen forming equipment and tools can be given
Element 6.6A.4 Form and shape material		
Criteria 6.6A.4.1 Material tapered, rolled and bent to conform with specifications	<i>Assessor guide: observe that –</i> Where appropriate, the material is tapered, rolled and bent in conformance with specifications and in accordance with standard operating procedures	<i>Assessor guide: confirm that –</i> The form and shape of the spring being made/repared can be identified The procedures for tapering, rolling and bending materials can be given The specifications of the form and shape to be produced can be identified The tools, techniques and equipment required to taper, roll and bend spring materials can be identified
Criteria 6.6A.4.2 Correct procedure adopted for both hot and cold forming	<i>Assessor guide: observe that –</i>	<i>Assessor guide: confirm that –</i> The applications of both hot and cold forming processes can be given The reasons for selecting hot and cold forming processes can be explained

Criteria 6.6A.4.3 Allowance made for relief and spring-back	<i>Assessor guide: observe that –</i> Appropriate allowance is made for relief and spring-back when forming and shaping materials to specification	<i>Assessor guide: confirm that –</i> The allowances to be made for relief and spring-back can be identified The reasons for making allowances for relief and spring-back can be given
Criteria 6.6A.4.4 Material lengths correctly determined	<i>Assessor guide: observe that –</i> The correct length of material is used when forming and shaping materials to specification	<i>Assessor guide: confirm that –</i> The length of material required to form and shape the spring to specification can be identified
Criteria 6.6A.4.5 Correct procedure utilised for buckling laminated springs	<i>Assessor guide: observe that –</i> Laminated springs are buckled safely and correctly in accordance with standard operating procedures	<i>Assessor guide: confirm that –</i> The procedures for buckling laminated springs can be given The tools, techniques and equipment required to buckle laminated springs can be identified The safety precautions to be taken when buckling laminated springs can be identified
Element 6.6A.5 Test components		
Criteria 6.6A.5.1 Spring compression determined from specifications	<i>Assessor guide: observe that –</i>	<i>Assessor guide: confirm that –</i> The spring specifications can be identified The appropriate testing techniques and equipment to be used to check for conformance to specification can be identified The procedures for testing springs for conformance to specification can be given
Criteria 6.6A.5.2 Defects and dimensional accuracy correctly determined	<i>Assessor guide: observe that –</i> The spring is tested for conformance with specifications in accordance with standard operating procedures The test results are recorded in accordance with standard operating procedures Where appropriate, defective springs are marked for repair/rework in accordance with standard operating procedures	<i>Assessor guide: confirm that –</i> The procedures for recording test results can be given The procedures for marking defective springs for repair/rework can be given
Criteria 6.6A.5.3 Springs correctly nested to specification	<i>Assessor guide: observe that –</i> The springs tested are correctly nested in accordance with standard operating procedures	<i>Assessor guide: confirm that –</i> The procedures for nesting springs can be given The reasons for nesting springs can be explained

Range statement

This unit refers to the forming, shaping and setting operations for springs. Materials typically include spring and stainless steels. Equipment range includes tapering, coiling, stripping and buckling; and spring testing machines, but does not include automated spring making equipment.

Evidence guide**Assessment context**

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with spring repair or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 6.7A A Perform basic incidental heat/quenching, tempering and annealing

Band – Specialisation band A

Field – Forging

Unit Weight 2

Element 6.7A.1 Determine job requirements

Criteria 6.7A.1.1

Job requirements determined from engineering drawing, job sheet or verbal instructions.

Assessor guide: observe that –

All relevant drawings, instructions and specifications are obtained in accordance with standard operating procedures.

Assessor guide: confirm that –

The process for heating/quenching and tempering achieve the required specifications can be identified. The process for annealing to achieve the required specifications can be identified.

Element 6.7A.2 Set up equipment for heat/quenching tempering and annealing

Criteria 6.7A.2.1

Appropriate heating process and/or procedure is identified.

Assessor guide: observe that –

The process for heating/quenching and tempering selected in accordance with workplace procedures. The process for annealing selected in accordance with workplace procedures.

Assessor guide: confirm that –

The process for heating/quenching and tempering work pieces of different materials can be given. The process for annealing work pieces of different materials can be given.

Criteria 6.7A.2.2

Equipment set up according to standard operating procedures and manufacturer's instructions.

Assessor guide: observe that –

The appropriate equipment is correctly set up for the required heat treatment process in accordance with standard operating procedures and manufacturer's instructions.

Assessor guide: confirm that –

Element 6.7A.3 Operate heating equipment**Criteria 6.7A.3.1**

All safety procedures observed.

Assessor guide: observe that –

Safety glasses and protective clothing is worn at all times.
The relevant safety procedures are followed at all times.

Assessor guide: confirm that –

Safety hazards associated with heat/quenching, tempering and annealing materials can be identified.

Criteria 6.7A.3.2

Appropriate heating equipment operating procedures followed.

Assessor guide: observe that –

Heating equipment is started up and operated in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for starting up and operating heating equipment can be identified.

Criteria 6.7A.3.3

Appropriate equipment adjustments are made.

Assessor guide: observe that –

Heating equipment is adjusted in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for adjusting heating equipment can be identified.

Criteria 6.7A.3.4

Material is treated to achieve required result.

Assessor guide: observe that –

Material is treated by the processes of heating; annealing; quenching and tempering to specification.

Assessor guide: confirm that –

The specifications for heating; annealing; quenching and tempering given materials can be identified.

Range statement

This unit applies to the heat treatment of ferrous and non ferrous metals of various types and thicknesses by a range of methods, which may include Oxy acetylene, LPG gas equipment, forge etc. and used to heat/quench temper and anneal materials to specifications. Work normally would cover one off processes or processes undertaken as incidental to trade work (eg. Toolmaking, metal spinning etc.) and are undertaken autonomously or as part of a team to predetermined standards of quality and safety. All work carried out to legislative and regulatory requirements. For more comprehensive or complex heating treatment, Units 6.3A (Carry out heat treatment) and 6.4A (Select heat treatment processes and test finished product) should also be considered. For continuous or batch heat treatment of materials Unit 7.24A (Operate and monitor machine/process) should be accessed.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with precision mechanical measurements or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 7.1A A Operational maintenance of machines/equipment

Band – Specialisation band A

Field – Machine & process operations

Unit Weight 2

Notes - This unit is to be assessed in conjunction with a production machine or equipment operation unit.

Pre-requisite units - Path 1

18.1A Use hand tools

Element 7.1A.1 Undertake programmed safety and maintenance checks

Criteria 7.1A.1.1

Checks undertaken safely and to prescribed procedure.

Assessor guide: observe that –

All maintenance and safety checks are undertaken safely and in accordance with work site procedures.

Assessor guide: confirm that –

All maintenance and safety checks to be undertaken for a specified machine/equipment can be identified.

Criteria 7.1A.1.2

Status/report recorded on proforma or reported orally.

Assessor guide: observe that –

The status of all components in the maintenance and safety checks are recorded/reported in accordance with work site procedures.

Assessor guide: confirm that –

The recording/reporting requirements associated with maintenance and safety checks can be identified.

Element 7.1A.2 Undertake programmed maintenance

Criteria 7.1A.2.1

Removal/replacement of consumable components undertaken to prescribed procedure and instructions followed.

Assessor guide: observe that –

Consumable components are removed/replaced in accordance with instructions and work site procedures. Adjustments are made in accordance with instructions and work site procedures.

Assessor guide: confirm that –

Consumable components to be removed/replaced can be identified Adjustment requirements can be identified.

Criteria 7.1A.2.2

Fluids and lubricants replaced and/or topped up to prescribed schedule.

Assessor guide: observe that –

The correct fluids are selected Fluids and lubricants are replaced and/or topped up in accordance with work site procedures.

Assessor guide: confirm that –

The fluids/lubricants to be replaced and/or topped up can be identified.

Range statement

Work undertaken in a team environment to predetermined specifications. Machines/equipment range includes manuals, semi-automatic and automatic machines of a stand-alone continuous production or process nature. Consumable replacements include air filter, oil wipers, grease containers, tool tips, indicator globes, fluids and lubricants, guides and limit switch actuators. Adjustments are of a limited nature and include safety guards, stops, wear pads and tool holders, nipping up of glands and adjustment of scrapers and aprons etc. This unit should not be selected when any of the following units are selected: Unit 18.55A (Dismantle, replace and assemble engineering components), Unit 18.6A (Dismantle/repair/replace/assemble and fit engineering components), Unit 7.5A (Perform general machining).

Evidence guide

Assessment context

This unit should be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit is to be assessed in conjunction with a production machine or equipment operation unit. The unit could also be assessed in conjunction with units assessing the safety, quality, communication, materials handling, recording and reporting associated with the operational maintenance of machines/equipment or other competencies requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with : - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents. - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment, the individual will: - demonstrate safe working practises at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities.

Unit MEM 7.2A A Perform precision shaping/planing/slotting operations

Band – Specialisation band A

Field – Machine & process operations

Unit Weight 4

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices

7.5A Perform general machining

9.2A Interpret technical drawing

18.1A Use hand tools

Element 7.2A.1 Observe safety precautions

Criteria 7.2A.1.1

Correct safety procedures observed and protective clothing and safety glasses worn.

Assessor guide: observe that –

Safety glasses and protective clothing is worn at all times.
The relevant safety procedures are followed at all times.

Assessor guide: confirm that –

Safety hazards associated with the use of shapers, planers and slotting machines can be identified.

Element 7.2A.2 Determine job requirements

Criteria 7.2A.2.1

Drawings interpreted, sequence of operations determined and tools selected to produce component to specification.

Assessor guide: observe that –

All relevant drawings, job instructions and specifications are obtained in accordance with work place procedures.

Assessor guide: confirm that –

The job requirements can be identified. The sequence of operations to achieve the job requirements can be identified. The tool type and geometry to achieve the required specifications can be identified. The effect of tool type and geometry on work pieces of different materials can be given.

Criteria 7.2A.2.2

Cutting parameters determined.

Assessor guide: observe that –

Assessor guide: confirm that –

Element 7.2A.3 Perform precision shaping operations**Criteria 7.2A.3.1**

Precision shaping operations carried out including precision flat surfaces, shoulders, slots, keyways, angles and dovetails.

Assessor guide: observe that –

The work piece is set up in accordance with specifications and standard operating procedures. Where appropriate, each of the following features is produced using a shaping machine in accordance with workplace procedures and to specifications:

- flat surfaces
- shoulders
- slots
- keyways
- angles
- dovetails

Assessor guide: confirm that –

The job set-up requirements can be identified. The tools, equipment and techniques to be used to set up the work piece can be identified. The procedures for setting up the work piece can be given. The techniques and procedures for machining the following can be given:

- flat surfaces
- shoulders
- slots
- keyways
- angles
- dovetails

Element 7.2A.4 Perform precision planing operations**Criteria 7.2A.4.1**

Precision planing operations carried out including horizontal and vertical surfaces and angles.

Assessor guide: observe that –

The work piece is set up in accordance with specifications and standard operating procedures. Where appropriate, each of the following features is produced using a planing machine in accordance with workplace procedures and to specification: - horizontal surfaces - vertical surfaces.

Assessor guide: confirm that –

The job set-up requirements can be identified. The tools, equipment and techniques to be used to set up the work piece can be identified. The procedures for setting up the work piece can be given. The techniques and procedures for machining the following can be given: - horizontal surfaces - vertical surfaces.

Element 7.2A.5 Perform precision slotting operations**Criteria 7.2A.5.1**

Precision slotting operations carried out including feathered and tapered keyways, slotting internal cavities, dovetails, slotting circular surfaces and internal splines.

Assessor guide: observe that –

The work piece is set up in accordance with specifications and standard operating procedures. Where appropriate, each of the following features is produced using a slotting machine in accordance with workplace procedures and to specification: - feathered keyways - tapered keyways - slotting internal cavities - dovetails - slotting circular surfaces - slotting internal splines.

Assessor guide: confirm that –

The job set-up requirements can be identified. The tools, equipment and techniques to be used to set up the work piece can be identified. The procedures for setting up the work piece can be given. The techniques and procedures for machining the following can be given: - feathered keyways - tapered keyways - slotting internal cavities - dovetails - slotting circular surfaces - slotting internal splines.

Element 7.2A.6 Check component for conformance to specification**Criteria 7.2A.6.1**

Component checked for conformance to specification using appropriate techniques tools and equipment.

Assessor guide: observe that –

Components are checked visually and dimensionally for conformance to specification in accordance with work site procedures. Appropriate measuring tools, techniques and equipment are used to check components for conformance to specification.

Assessor guide: confirm that –

The appropriate techniques, tools and equipment to measure machined components can be identified.

Range statement

Work is performed to established processes, practices and standards of quality, safety and workshop procedures. Work is performed to drawings or sketches, specifications and instructions as appropriate. Work applies to a range of one or more of precision shaping, planing or slotting operations where achievement of the specified tolerance and finish is mandatory. Precision measuring instruments, standard engineering materials and cutting tools are used.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the performance of precision shaping/planing/slotting operations or other units requiring the exercise of the skills and knowledge covered by this unit. To be assessed as competent in this unit, the individual must operate at least one or more of the precision machining operations identified in elements 7.2A.3, 7.2A.4 and 7.2A.5. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 7.3A A Setting machines (routine)

Band – Specialisation band A

Field – Machine & process operations

Unit Weight 4

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices

18.1A Use hand tools

7.24A Operate and monitor machine/process

9.1A Draw and interpret sketch

Pre-requisite units - Path 2

2.5C11 Measure with graduated devices

18.1A Use hand tools

7.24A Operate and monitor machine/process

9.2A Interpret technical drawing

Element 7.3A.1 Determine job requirements

Criteria 7.3A.1.1

Job sheets or equivalent instructions interpreted correctly and understood.

Assessor guide: observe that –

Job sheets and/or instructions are obtained in accordance with work place procedures.

Assessor guide: confirm that –

The work to be undertaken can be identified.

Element 7.3A.2 Set machine

Criteria 7.3A.2.1

Safe working practices are understood and implemented.

Assessor guide: observe that –

All work is carried out safely in accordance with standard operating procedures.

Assessor guide: confirm that –

The relevant safety and standard operating procedures can be identified.

Criteria 7.3A.2.2

Machine set in accordance with defined procedures.

Assessor guide: observe that –

The machine is set in accordance with standard operating procedures.

Assessor guide: confirm that –

The machine setting procedures can be identified.

Criteria 7.3A.2.3

Machine adjusted to meet specifications and operational requirements.

Assessor guide: observe that –

The machine is adjusted to meet specifications and operational requirements in accordance with standard operating procedures.

Assessor guide: confirm that –

The relevant machine and operational specifications can be identified.

Criteria 7.3A.2.4

First-off samples measured for compliance with specifications.

Assessor guide: observe that –

The first-off samples are measured for compliance with specifications.

Assessor guide: confirm that –

The specifications of the part to be produced can be identified.

Element 7.3A.3 Instruct machine operator**Criteria 7.3A.3.1**

Machine operator instructed if necessary on sequencing settings and any required safety procedures.

Assessor guide: observe that –

Where appropriate, the machine operator is instructed on the sequence of operations and any required safety procedures.

Assessor guide: confirm that –

The sequence of operations of the machine can be identified. Where appropriate, required safety procedures can be identified.

Element 7.3A.4 Replace worn/damaged tooling**Criteria 7.3A.4.1**

Worn or damaged tooling identified and changed as required.

Assessor guide: observe that –

Where appropriate, worn or damaged tooling is identified and changed in accordance with standard operating procedures.

Assessor guide: confirm that –

Common examples of worn or damaged tooling can be identified. The effects of worn or damaged tooling on the component to be produced can be identified.

Range statement

This unit applies to a range of non-NC/CNC equipment which may be used for removing metal, bending, rolling, joining, extruding, pressing, moulding and die casting on a range of materials, including metals, plastics, fibre etc. If interpretation of drawings to Australian Standard 1100 or equivalent is required, Unit 9.2A (Interpret technical drawing) should be selected. For setting automated assembly processes, see Unit 3.7A (Setting multistage continuous process lines). Where setting skills for NC/CNC are required Unit 7.15A (Set NC/CNC machines/process (basic)) should be selected.

Evidence guide

Assessment context

This unit should be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the routine setting of machines or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 7.4A A Setting machines (complex)

Band – Specialisation band A

Field – Machine & process operations

Unit Weight 8

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices
9.2A Interpret technical drawing

7.5A Perform general machining
18.1A Use hand tools

7.6A Perform lathe operations

Pre-requisite units - Path 2

2.5C11 Measure with graduated devices
9.2A Interpret technical drawing

7.5A Perform general machining
18.1A Use hand tools

7.7A Perform milling operations

Pre-requisite units - Path 3

2.5C11 Measure with graduated devices
9.2A Interpret technical drawing

7.5A Perform general machining
18.1A Use hand tools

7.8A Perform grinding operations

Pre-requisite units - Path 4

2.5C11 Measure with graduated devices

9.2A Interpret technical drawing

7.5A Perform general machining

18.1A Use hand tools

7.13A Perform machining operations using horizontal and/or vertical boring machine

Pre-requisite units - Path 5

2.5C11 Measure with graduated devices
7.24A Operate and monitor machine/process
18.1A Use hand tools

7.1A Operational maintenance of machines/equipment
7.25A Advanced machine/process operation

7.3A Setting machines (routine)
9.1A Draw and interpret sketch

Pre-requisite units - Path 6

2.5C11 Measure with graduated devices
7.24A Operate and monitor machine/process
18.1A Use hand tools

7.1A Operational maintenance of machines/equipment
7.26A Advanced plastic processing

7.3A Setting machines (routine)
9.1A Draw and interpret sketch

Pre-requisite units - Path 7

2.5C11 Measure with graduated devices
7.24A Operate and monitor machine/process
18.1A Use hand tools

7.1A Operational maintenance of machines/equipment
7.27A Advanced press operations

7.3A Setting machines (routine)
9.1A Draw and interpret sketch

Pre-requisite units - Path 8

2.5C11 Measure with graduated devices
 7.24A Operate and monitor machine/process
 18.1A Use hand tools

7.1A Operational maintenance of machines/equipment
 7.25A Advanced machine/process operation

7.3A Setting machines (routine)
 9.2A Interpret technical drawing

Pre-requisite units - Path 9

2.5C11 Measure with graduated devices
 7.24A Operate and monitor machine/process
 18.1A Use hand tools

7.1A Operational maintenance of machines/equipment
 7.26A Advanced plastic processing

7.3A Setting machines (routine)
 9.2A Interpret technical drawing

Pre-requisite units - Path 10

2.5C11 Measure with graduated devices
 7.24A Operate and monitor machine/process
 18.1A Use hand tools

7.1A Operational maintenance of machines/equipment
 7.27A Advanced press operations

7.3A Setting machines (routine)
 9.2A Interpret technical drawing

Element 7.4A.1 Determine job requirements

Criteria 7.4A.1.1

Job sheets or equivalent instructions interpreted correctly and understood.

Assessor guide: observe that –

Job sheets and/or instructions are followed safely in accordance with work site procedures.

Assessor guide: confirm that –

The work requirements can be identified.

Element 7.4A.2 Set machine

Criteria 7.4A.2.1

Safe working practices are understood and implemented.

Assessor guide: observe that –

All work is carried out safely in accordance with work site procedures.

Assessor guide: confirm that –

The safety features of the machine can be identified. The safety precautions to be taken while setting the machine can be identified.

Criteria 7.4A.2.2

Machine sequencing set up which may include the selection of gears, cams, trip dogs, pin boards or other timing mechanisms.

Assessor guide: observe that –

The sequence of machine operations is in accordance with instructions.

Assessor guide: confirm that –

The sequencing requirements of the machine's operations can be identified. The methods of sequencing the machine's operations can be identified.

Criteria 7.4A.2.3

Machine adjusted to meet specifications and operational requirements.

Assessor guide: observe that –

The tooling, equipment and timing of the machine is adjusted to operational requirements and specifications.

Assessor guide: confirm that –

Product specifications can be identified. The operational requirements of the machine can be identified.

Criteria 7.4A.2.4

First-off samples measured and inspected for compliance with specifications.

Assessor guide: observe that –

The first-off samples are inspected visually and dimensionally for conformance to specification. Where appropriate, further adjustment is made to achieve specification requirements.

Assessor guide: confirm that –

Common product faults or defects can be identified. Methods of adjusting out given faults or defects can be given.

Element 7.4A.3 Instruct machine operator**Criteria 7.4A.3.1**

Machine operator instructed if necessary on sequencing settings and any required safety procedures.

Assessor guide: observe that –

The machine operator is instructed on the safety procedures to be followed and the sequencing of the machine. Confirmation is obtained from the machine operator that the machine sequence and safety procedures are understood.

Assessor guide: confirm that –

The consequences of not instructing the machine operator on the sequence of the machine and safety procedures can be given.

Element 7.4A.4 Replace worn/damaged tooling**Criteria 7.4A.4.1**

Tools changed and settings adjusted to specification as required.

Assessor guide: observe that –

Worn or damaged tooling is replaced and set to specification in accordance with work site procedures.

Assessor guide: confirm that –

The effects of worn/damaged tooling on product quality can be given.

Range statement

Work undertaken autonomously or in a team environment. This unit builds on the skills described in Unit 7.3A (Setting machines (routine)) and applies to the setting of a range of non-numerical control/computer numerical control production machines and processes. This may include manual, semi-automatic and automatic machines. Where numerical control/computer numerical control skills are required, Unit 7.15A (Set NC/CNC machines/process (basic)) should be selected.

Evidence guide

Assessment context

This unit should be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the setting of machines, or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents. - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. The candidate will be required to: - Orally, or by other methods of communication answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment, the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 7.5A A Perform general machining

Band – Specialisation band A

Field – Machine & process operations

Unit Weight 8

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices

9.2A Interpret technical drawing

18.1A Use hand tools

Element 7.5A.1 Determine job requirements

Criteria 7.5A.1.1

Drawings, instructions and specifications interpreted and understood.

Assessor guide: observe that –

All relevant drawings, instructions and specifications are obtained in accordance with workplace procedures.

Assessor guide: confirm that –

The work to be undertaken can be identified. The specifications pertaining to the work to be done can be identified.

Element 7.5A.2 Determine sequence of operations

Criteria 7.5A.2.1

Sequence of operations including job set up is determined for maximum efficiency and to meet job specifications.

Assessor guide: observe that –

A work plan is prepared identifying the sequence of operations to be performed.

Assessor guide: confirm that –

The operations to be performed can be identified. The reasons for selecting the chosen sequence of operations can be explained. The machines/equipment necessary to perform those operations can be identified. The method of job holding to be used can be identified.

Criteria 7.5A.2.2

Appropriate material selected and datum established as required.

Assessor guide: observe that –

Appropriate material is selected in accordance with standard operating procedures.

Assessor guide: confirm that –

The material to be used can be identified. Where appropriate, datum points/ lines can be identified.

Element 7.5A.3 Select and mount tools**Criteria 7.5A.3.1**

Appropriate tools for job selected, sharpened and shaped as required.

Assessor guide: observe that –

Where appropriate, cutting tools are sharpened and shaped to suit the materials to be cut and the operations to be performed in accordance with standard operating procedures.

Assessor guide: confirm that –

A range of cutting tools and their application can be identified. The correct geometry for cutting tools for a range of materials and applications can be identified from appropriate data sheets/texts. Worn or damaged cutting tools can be identified. The benefits of using correctly sharpened cutting tools can be given. The cutting tools appropriate to the operations to be performed can be identified.

Criteria 7.5A.3.2

Tools mounted and positioned correctly.

Assessor guide: observe that –

All tools are mounted and positioned correctly in accordance with standard operating procedures.

Assessor guide: confirm that –

The correct methods of mounting a variety of cutting tools can be given.

Element 7.5A.4 Perform machining operations**Criteria 7.5A.4.1**

Basic marking out techniques used where required.

Assessor guide: observe that –

Where appropriate, materials are marked out to facilitate machining in accordance with standard operating procedures.

Assessor guide: confirm that –

The reasons for marking out materials can be given.

Criteria 7.5A.4.2

Machining parameters set for job requirements and maximum tool life.

Assessor guide: observe that –

The machining parameters are set to achieve the job requirements and maximise tool life in accordance with standard operating procedures.

Assessor guide: confirm that –

Criteria 7.5A.4.3

Work held or correctly clamped without damage to product and all safety requirements met.

Assessor guide: observe that –

Appropriate and sufficient clamping/mounting is used and workpiece is not damaged or distorted.

Assessor guide: confirm that –

Safety issues can be explained with regard to correct clamping.

Criteria 7.5A.4.4

Machining performed in a safe manner utilising all guards, safety procedures and personal protective clothing and equipment.

Assessor guide: observe that –

Operations are performed according to the established machining parameters and safety procedures and requirements. Correct coolant/lubricant is used where required.

Assessor guide: confirm that –

Safety issues can be explained with regard to adequate guards, shields etc. as well as personal protective clothing and equipment.

Element 7.5A.5 Measure components**Criteria 7.5A.5.1**

Components checked with appropriate instruments or gauges to ensure compliance with specifications.

Assessor guide: observe that –

Correct measuring devices selected and used with checks against specifications.

Assessor guide: confirm that –

Operator is aware of tolerances, limits etc.

Element 7.5A.6 Adjust and maintain machine**Criteria 7.5A.6.1**

Routine maintenance and adjustments carried out as required which may include slide and collar adjustment, cleaning and lubrication and the like.

Assessor guide: observe that –

Adjustments and lubrication are made according to standard operating procedures. Machine appropriately cleaned.

Assessor guide: confirm that –

Operator can describe situations indicating the need for machine adjustment, lubrication and cleaning.

Range statement

Machining is undertaken on one or more of a range of standard machine tools. Work is undertaken to predetermined specifications. Machines are not CNC (computer numerical control) machines and may include lathes, mills, planers, shapers, drills, slotters, surface grinders etc. Materials may include standard ferrous and non-ferrous materials. Operations and set up carried out on those machines are straightforward and may include parallel cutting, slotting, planing, drilling, knurling, cutting flats, non-precision surface grinding operations etc. Surface grinding operations covered by this unit are those requiring magnetic chucks and grinding of flat surfaces. Machining parameters include speeds, feeds, stops, coolant and cutting lubricants etc. Work is carried out autonomously to predetermined standards of quality and safety. Drilling operations in this unit exclude those covered by Unit 18.2A (Use power tools/hand held operations). Where substantial marking out is required, Unit 12.6A (Mark off/out (general engineering)) should be considered. Where precision measurement is required, Unit 12.3A (Precision mechanical measurement) should also be considered. For set up and operation of EDM machines, see Unit 7.14A (Perform electro-discharge (EDM) machining operations).

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with general machining or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 7.6A A Perform lathe operations

Band – Specialisation band A

Field – Machine & process operations

Unit Weight 4

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices

18.1A Use hand tools

7.5A Perform general machining

9.2A Interpret technical drawing

Element 7.6A.1 Observe safety precautions

Criteria 7.6A.1.1

Correct safety procedures observed and protective clothing and safety glasses worn.

Assessor guide: observe that –

Safety glasses and protective clothing is worn at all times.
The relevant safety procedures are followed at all times.

Assessor guide: confirm that –

Safety hazards associated with the use of lathes can be identified.

Element 7.6A.2 Determine job requirements

Criteria 7.6A.2.1

Drawings interpreted, sequence of operation determined and tools selected to produce component to specification.

Assessor guide: observe that –

Drawings and job instructions/specifications are obtained in accordance with work site procedures.

Assessor guide: confirm that –

The job requirements can be identified. The sequence of operations to achieve the job requirements can be identified. The tool type and geometry to achieve the required specifications can be identified. The effect on tool type and geometry for work pieces of different materials can be given.

Element 7.6A.3 Mount job

Criteria 7.6A.3.1

Job set up using instruments such as dial test indicators, and digital read-out equipment.

Assessor guide: observe that –

Work piece set up in accordance with specifications and work site procedures. Where appropriate, dial test indicators and digital read-out equipment used in accordance with work site procedures.

Assessor guide: confirm that –

The job set up requirements can be identified. Instruments available to assist in the setting up of work pieces and their application can be identified.

Element 7.6A.4 Perform turning operations

Criteria 7.6A.4.1

Speeds and feeds are calculated using appropriate mathematical techniques and reference material.

Assessor guide: observe that –

Cutting feeds and speeds appropriate to the job are used.

Assessor guide: confirm that –

The cutting speeds and feeds appropriate to the job have been calculated. The consequences of varying speeds and feeds from the optimum rates calculated can be given. The effects of different materials on cutting speeds and feeds can be identified.

Criteria 7.6A.4.2

Uses the full range of accessories on a centre lathe including three and four jaw chucks, centres, face plate, steadies, cross slide and tailstock.

Assessor guide: observe that –

Each of the following accessories on a centre lathe are used in accordance with work site procedures: -three jaw chuck - four jaw chuck - centres - face plate - steadies - cross slide - tailstock.

Assessor guide: confirm that –

The application of each of the following accessories to lathe operations on a centre lathe can be given: - three jaw chuck - four jaw chuck - centres - face plate - steadies - cross slide - tailstock.

Criteria 7.6A.4.3

Boring, drilling, reaming, single start thread cutting, parting off operations are performed to specification.

Assessor guide: observe that –

Each of the following operations is performed on a centre lathe in accordance with work site procedures and to specification: - boring - drilling - reaming - single start thread cutting - parting off.

Assessor guide: confirm that –

The operations that can be performed on a centre lathe can be identified. Typical applications for each of the following operations can be given: - boring - drilling - reaming - single start thread cutting - parting off.

Element 7.6A.5 Check components for conformance with specifications

Criteria 7.6A.5.1

Components checked for conformance to specification using appropriate techniques, tools and equipment.

Assessor guide: observe that –

Components are checked visually and dimensionally for conformance to specification in accordance with work site procedures. Appropriate measuring tools, techniques and equipment are used to check components for conformance to specification.

Assessor guide: confirm that –

Appropriate techniques, tools and equipment to measure turned components can be identified.

Range statement

Work is performed to established processes, practices and specifications. Work applies to a range of lathes and accessories, precision measuring equipment, cutting tools and standard engineering materials. Cutting tools are selected using International Standard Organisation (I.S.O.) standards or according to Standard Operating Procedure as appropriate. Work is performed to drawings, sketches, specifications and instructions as appropriate. Work is carried out autonomously to predetermined standards of quality and safety.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the performance of lathe operations, or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant drawings, manuals, codes, standards and reference material. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment, the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 7.7A A Perform milling operations

Band – Specialisation band A

Field – Machine & process operations

Unit Weight 4

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices

7.5A Perform general machining

9.2A Interpret technical drawing

18.1A Use hand tools

Element 7.7A.1 Observe safety precautions

Criteria 7.7A.1.1

Correct safety procedures are observed, protective clothing and safety glasses worn.

Assessor guide: observe that –

Safety glasses and protective clothing are worn at all times. The relevant safety procedures are followed at all times.

Assessor guide: confirm that –

The safety hazards associated with the use of milling machines can be identified.

Element 7.7A.2 Determine job requirements

Criteria 7.7A.2.1

Drawings interpreted, sequence of operations determined and tools selected to produce component to specification.

Assessor guide: observe that –

Drawings and job instructions/ specifications are obtained in accordance with work site procedures.

Assessor guide: confirm that –

The job requirements can be identified. The sequence of operations to achieve the job requirements can be identified. The cutter type and geometry to achieve the required specifications can be identified. The effect on cutter type and geometry for work pieces of different materials can be given.

Criteria 7.7A.2.2

Cutting parameters determined.

Assessor guide: observe that –

Cutting feeds and speeds appropriate to the job are used.

Assessor guide: confirm that –

The cutting feeds and speeds appropriate to the job have been calculated. The consequences of varying speeds and feeds from the optimum rates calculated can be given. The effects of different materials on cutting speeds and feeds can be identified.

Element 7.7A.3 Perform milling operations**Criteria 7.7A.3.1**

Milling operations carried out to produce components to specification.

Assessor guide: observe that –

The milling operations are carried out in a manner to produce components to specification.

Assessor guide: confirm that –

The specifications of the components to be produced can be identified.

Criteria 7.7A.3.2

Operations are undertaken using conventional and/or climb milling techniques and a variety of cutters including slab, gang, end, shell, slot, form, slitting.

Assessor guide: observe that –

The following cutters are used in conjunction with conventional and/or climb milling techniques to produce components to specification: - slab - gang - shell - slot - form - slitting.

Assessor guide: confirm that –

Conventional and climb milling techniques and their applications can be described. The application of each of the following types of cutter can be given: - slab - gang - shell - slot - form - slitting.

Criteria 7.7A.3.3

The full range of standard accessories are used including dividing heads and rotary tables as required.

Assessor guide: observe that –

Where appropriate, the following accessories are used on a milling machine in accordance with standard operating procedures: - dividing head - rotary table.

Assessor guide: confirm that –

The procedures for using dividing heads and rotary tables on milling machines can be given. Applications requiring the use of dividing heads and rotary tables when milling components can be identified.

Element 7.7A.4 Check components for conformance to specification**Criteria 7.7A.4.1**

Component checked for conformance to specification using appropriate techniques, tools and equipment.

Assessor guide: observe that –

Components are checked visually and dimensionally for conformance to specification in accordance with work site procedures. Appropriate measuring tools, techniques and equipment are used to check components for conformance to specification.

Assessor guide: confirm that –

Appropriate techniques, tools and equipment to measure milled components can be identified.

Range statement

Work is performed to established processes, practices and specifications. Work applies to a range of milling machines including vertical, horizontal and universal types, a range of precision measuring equipment and standard engineering materials and cutting tools. Cutting tools are selected using International Standard Organisation standards or according to standard operating procedure as appropriate. Work is performed to drawings or sketches, specifications and instructions as appropriate. Work is carried out autonomously and employees take responsibility for the quality of their own work.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the performance of milling operations or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 7.8A B Perform grinding operations

Band – Specialisation band A

Field – Machine & process operations

Unit Weight 4

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices

18.1A Use hand tools

7.5A Perform general machining

9.2A Interpret technical drawing

Element 7.8A.1 Determine job requirements

Criteria 7.8A.1.1

Job requirements determined from specifications and sequence of operations determined.

Assessor guide: observe that –

All relevant drawings, instructions and specifications are obtained in accordance with workplace procedures.

Assessor guide: confirm that –

The work to be undertaken can be identified. The sequence of operations to be performed can be identified. The specifications to be achieved can be identified.

Criteria 7.8A.1.2

Correct and appropriate holding devices selected and applied.

Assessor guide: observe that –

The work is set up correctly and accurately in accordance with specifications and standard operating procedures.

Assessor guide: confirm that –

A variety of work holding devices/ accessories appropriate to grinding tasks can be identified. The reasons for selecting the chosen work holding device/accessory can be explained. The tools, techniques and equipment required to set up the work to the required accuracy can be identified. The reasons for selecting the tools, techniques and equipment to be used to set up the work can be given.

Element 7.8A.2 Observe safety precautions

Criteria 7.8A.2.1

Machine guards, coolant and dust extraction devices checked.

Assessor guide: observe that –

All machine guards, coolant and dust extraction devices are checked for correct operation in accordance with standard operating procedures.

Assessor guide: confirm that –

All machine guards can be identified. The function of coolant and dust extraction devices can be identified.

Criteria 7.8A.2.2

Correct safety procedures observed, protective clothing and safety glasses worn.

Assessor guide: observe that –

The correct safety procedures are followed and personal protective clothing and equipment is worn/used throughout the grinding process.

Assessor guide: confirm that –

All relevant safety procedures can be identified. All necessary personal protective clothing and equipment can be identified. The hazards associated with tool and cutter grinding operations can be identified.

Element 7.8A.3 Select appropriate wheels and accessories**Criteria 7.8A.3.1**

Wheels selected, balanced and dressed based on knowledge of grinding wheel structure Accessories selected to facilitate production to job specifications.

Assessor guide: observe that –

The grinding wheel selected is safely dressed to form and size required to carry out the grinding task in accordance with standard operating procedures. The grinding accessories appropriate to the grinding task(s) are selected and correctly used in accordance with standard operating procedures.

Assessor guide: confirm that –

The standard grinding wheel shapes can be identified. A range of abrasive materials used in grinding wheels can be identified. The effect of the following grinding wheel features on wheel selection and application can be explained: - grain size of abrasive particles - grade or strength of bond - bond material. The appropriate grinding wheel(s) for the given task(s) can be identified. The reasons for selecting the appropriate grinding wheel can be given. The procedures for dressing grinding wheels can be correctly identified. Grinding wheel dressing tools and their application can be identified. The appropriate grinding wheel dressing tool(s) for the given task(s) can be identified. The function and application of the full range of grinding accessories can be explained.

Element 7.8A.4 Perform grinding operations**Criteria 7.8A.4.1**

Grinding machine is set up and adjusted in accordance with defined procedures.

Assessor guide: observe that –

Grinding media, coolant, machine settings are set up correctly ready for grinding operation.

Assessor guide: confirm that –

Machine setting procedures can be explained. The function of any accessories to be used in conjunction with the internal/external cylindrical grinding process can be identified.

Criteria 7.8A.4.2

Workpiece is held or clamped appropriately to avoid damage.

Assessor guide: observe that –

Appropriate and sufficient clamping/mounting is used to prevent damage or distortion to the workpiece.

Assessor guide: confirm that –

Clamping methods and accessories can be identified and the principles of effective clamping explained.

Criteria 7.8A.4.3

Grinding operations are performed safely, utilising all guards, safety procedures and personal protective clothing and equipment.

Assessor guide: observe that –

Grinding operations are performed according to the established machining parameters, safety procedures and specifications and standard operating procedures. Correct coolant/lubricant is used where required.

Assessor guide: confirm that –

Safety issues and precautions can be explained with regard to adequate guarding and personal protective clothing and equipment. Grinding operations/procedures can be explained. The function of any accessories to be used in conjunction with the grinding process can be identified.

Element 7.8A.5 Check components for conformance with specifications**Criteria 7.8A.5.1**

Components checked for conformance to specification using appropriate techniques, tools and equipment.

Assessor guide: observe that –

The ground components are checked for conformance with specifications in accordance with standard operating procedures.

Assessor guide: confirm that –

Tools, techniques and equipment appropriate to the checking of ground components for conformance to the following specifications can be identified: - dimensions and tolerances - geometry and tolerances - surface finish. The tools, techniques and equipment to be used to check the given ground components for conformance with specifications can be identified. The reasons for selecting the tools, techniques and equipment to be used can be explained.

Range statement

Work is performed to established processes, practices and specifications. Work can apply to one or more of a range of grinding machines including surface, cylindrical and centreless machines, a range of precision measuring equipment and standard engineering materials and tooling. Work is performed to drawings or sketches, specifications and instructions as appropriate. Work is carried out autonomously to predetermined standards of quality and safety.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the performance of grinding operations or other units requiring the exercise of the skills and knowledge covered by this unit. To be assessed as competent in this unit, the individual must operate at least one or more of the grinding machines identified in Criteria 7.8A.4.1 (Surface grinding carried out to specification as required), Criteria 7.8A.4.2 (Internal and external grinding carried out to specification as required) or Criteria 7.8A.4.3 (Centreless grinding carried out to specification as required). Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 7.9A A Perform precision jig boring operations

Band – Specialisation band A

Field – Machine & process operations

Unit Weight 4

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices

9.2A Interpret technical drawing

7.5A Perform general machining

12.3A Precision mechanical measurement

7.7A Perform milling operations

18.1A Use hand tools

Element 7.9A.1 Observe safety precautions

Criteria 7.9A.1.1

Correct safety procedures observed and protective clothing and safety glasses worn.

Assessor guide: observe that –

Correct safety procedures are followed and protective clothing and equipment is worn/used at all times.

Assessor guide: confirm that –

The appropriate safety procedures are identified. The appropriate personal protective clothing and equipment can be identified.

Element 7.9A.2 Determine job requirements

Criteria 7.9A.2.1

Drawings interpreted and sequence of operations determined.

Assessor guide: observe that –

All relevant drawings, instructions and specifications obtained in accordance with workplace procedures.

Assessor guide: confirm that –

The work to be undertaken can be identified. The sequence of operations to be followed in carrying out the work can be identified.

Element 7.9A.3 Select appropriate tools and accessories

Criteria 7.9A.3.1

Tools and accessories selected in accordance with standard operating procedures to meet job specifications.

Assessor guide: observe that –

Assessor guide: confirm that –

The tools and accessories necessary to perform the required operations to specification can be identified. The standard operating procedures applicable to the work can be identified.

Element 7.9A.4 Mount job**Criteria 7.9A.4.1**

Job set up using instruments such as dial test indicators and digital read out equipment.

Assessor guide: observe that –

The work is set up using precision measuring equipment in accordance with standard operating procedures.

Assessor guide: confirm that –

The precision measuring equipment appropriate to the work to be mounted can be identified.

Element 7.9A.5 Perform jig boring**Criteria 7.9A.5.1**

Holes bored relative to coordinate position and to specification.

Assessor guide: observe that –

The holes are bored in the correct coordinates and to specification in accordance with standard operating procedures.

Assessor guide: confirm that –

The coordinates of the holes to be bored can be identified.

Criteria 7.9A.5.2

Use rotary or tilting rotary table as required.

Assessor guide: observe that –

Where appropriate, rotary or tilting rotary tables are used in accordance with standard operating procedures.

Assessor guide: confirm that –

The application of rotary and tilting rotary tables to jig boring operations can be given.

Element 7.9A.6 Check components for conformance to specification**Criteria 7.9A.6.1**

Components checked for conformance to specification using appropriate techniques, tools and equipment.

Assessor guide: observe that –

The bored components are checked for conformance to specification using appropriate techniques, tools and equipment in accordance with standard operating procedures.

Assessor guide: confirm that –

A range of precision measuring techniques and their application can be identified. The appropriate measuring equipment for checking the bored components for conformance to specification can be identified.

Range statement

Work is performed to established processes, practices and standards. Work applies to precision jig boring operations using a range of machines including jig boring machines, milling machines etc. Work is performed to drawings or sketches, specifications and instructions as appropriate. Work is carried out autonomously to predetermined standards of quality and safety.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with precision jig boring or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 7.10A A Perform tool and cutter grinding operations

Band – Specialisation band A

Field – Machine & process operations

Unit Weight 4

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices

9.2A Interpret technical drawing

7.5A Perform general machining

12.3A Precision mechanical measurement

7.8A Perform grinding operations

18.1A Use hand tools

Element 7.10A.1 Observe safety precautions

Criteria 7.10A.1.1

Machine guards, coolant and dust extraction devices checked.

Assessor guide: observe that –

All machine guards, coolant and dust extraction devices are checked for correct operation in accordance with standard operating procedures.

Assessor guide: confirm that –

All machine guards can be identified. The function of coolant and dust extraction devices can be identified.

Criteria 7.10A.1.2

Correct safety procedures observed, protective clothing and safety glasses worn.

Assessor guide: observe that –

The correct safety procedures are followed and personal protective clothing and equipment is worn/ used throughout the grinding process.

Assessor guide: confirm that –

All relevant safety procedures can be identified. All necessary personal protective clothing and equipment can be identified. The hazards associated with tool and cutter grinding operations can be identified.

Element 7.10A.2 Determine job requirements

Criteria 7.10A.2.1

Drawings interpreted and sequence of operations determined.

Assessor guide: observe that –

All relevant drawings, instructions and specifications are obtained in accordance with workplace procedures.

Assessor guide: confirm that –

The work to be undertaken can be identified. The sequence of operations to be performed can be identified. The specifications to be achieved can be identified.

Element 7.10A.3 Select appropriate tool and cutter grinding wheels and accessories**Criteria 7.10A.3.1**

Tool and cutter grinding wheels selected, based on knowledge of grinding wheel structure, balanced and dressed. Accessories selected to facilitate production to specification.

Assessor guide: observe that –

Tool and cutter grinding accessories appropriate to the grinding task(s) are selected and correctly used in accordance with standard operating procedures. The grinding wheel selected is safely balanced and correctly dressed for the grinding task(s) to be performed in accordance with standard operating procedures.

Assessor guide: confirm that –

The standard grinding wheel shapes can be identified. A range of abrasive materials used in grinding wheels can be identified. The effect of the following grinding wheel features on wheel selection and application can be explained: - grain size of abrasive particles - grade or strength of bond - structure of grain spacing - bond material. The appropriate grinding wheel(s) for the given task(s) can be identified. The reasons for selecting the appropriate grinding wheel can be given. The function and application of the full range of tool and cutter grinding accessories can be explained. Grinding wheel dressing procedures can be correctly identified. Grinding wheel dressing tools and their application can be identified. The appropriate grinding wheel dressing tool(s) for the given task(s) can be identified.

Element 7.10A.4 Perform tool and cutter grinding**Criteria 7.10A.4.1**

Universal tool and cutter grinding machines operated to sharpen and shape the full range of tools and cutters including side and face cutters, end mill, form relieved milling cutters, flat, vee and circular form tools and hobs, slitting saws, drills and reamers.

Assessor guide: observe that –

The universal tool and cutter grinder is used to correctly sharpen and shape a range of tools and cutters in accordance with standard operating procedures.

Assessor guide: confirm that –

The source(s) of data on tool geometry for the full range of tools and cutters can be identified. The nomenclature used to describe tool geometry can be explained. The correct tool geometry for the tools/cutters to be sharpened and shaped can be identified.

Criteria 7.10A.4.2

Parallel internal and/or external grinding carried out.

Assessor guide: observe that –

The appropriate accessories are correctly set up in accordance with standard operating procedures to enable parallel internal and/or external grinding to be carried out. The parallel grinding task is completed in conformance with specifications and standard operating procedures.

Assessor guide: confirm that –

The accessories to be used when parallel grinding on a tool and cutter grinder can be identified. The procedures to be followed when parallel grinding on a tool and cutter grinder can be explained.

Criteria 7.10A.4.3

Internal and/or external taper grinding carried out to drawing specifications.

Assessor guide: observe that –

The appropriate accessories are correctly set up in accordance with standard operating procedures to enable internal and/or external taper grinding to be carried out. The taper grinding task is completed in conformance with specifications and standard operating procedures.

Assessor guide: confirm that –

The accessories to be used when grinding tapers on a tool and cutter grinder can be identified. The procedures to be followed when grinding tapers on a tool and cutter grinder can be explained.

Element 7.10A.5 Check components for conformance to specification**Criteria 7.10A.5.1**

Components checked for conformance to specification using appropriate techniques, tools and equipment.

Assessor guide: observe that –

The ground components are checked for conformance with specifications in accordance with standard operating procedures.

Assessor guide: confirm that –

Tools, techniques and equipment appropriate to the checking of ground components for conformance with the following specifications can be identified: - dimensions and tolerances - geometry and tolerances - surface finish. The tools, techniques and equipment to be used to check the given ground components for conformance with specifications can be identified. The reasons for selecting the tools, techniques and equipment to be used can be explained.

Range statement

This unit covers a range of tool and cutter grinding machines and accessories. A range of precision measuring instruments are used. Work is performed to established processes, practices and standards. A range of precision measuring instruments and standard engineering materials are used. Work is performed to drawings or sketches, specifications and instructions as appropriate. General off hand grinding is covered by Unit 18.2A (Use power tools/hand held operations). Work is carried out autonomously to predetermined standards of quality and safety.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with tool and cutter grinding or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 7.11A A Complex milling operations

Band – Specialisation band A

Field – Machine & process operations

Unit Weight 4

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices
 2.13C5 Perform mathematical computations
 9.2A Interpret technical drawing

2.7C10 Perform computations - basic
 7.5A Perform general machining
 12.3A Precision mechanical measurement

2.8C10 Perform computations
 7.7A Perform milling operations
 18.1A Use hand tools

Element 7.11A.1 Set up work

Criteria 7.11A.1.1

Work is set up to required level of accuracy using instruments such as dial test indicators and sine bars.

Assessor guide: observe that –

The work is set up to the required level of accuracy using appropriate precision measuring equipment in accordance with standard operating procedures.

Assessor guide: confirm that –

The precision measuring equipment appropriate to the accuracy required in setting up the work can be identified. The reasons for selecting the chosen measuring equipment can be given. The procedures for accurately setting up the work can be given.

Element 7.11A.2 Identify inserts from International Standard Organisation standards

Criteria 7.11A.2.1

Correct tool is selected using International Standard Organisation standards to suit cutting parameters.

Assessor guide: observe that –

The correct milling cutter inserts are selected for the cutting parameters in accordance with ISO standards.

Assessor guide: confirm that –

The ISO standards applicable to milling cutter inserts can be identified. The cutting parameters for the work to be undertaken can be determined.

Element 7.11A.3 Perform complex milling

Criteria 7.11A.3.1

Racks and gears are cut and associated calculations performed.

Assessor guide: observe that –

The relevant rack and gear calculations are correctly completed. Racks and gears are cut to specification in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for cutting racks and gears can be given. The calculations to be performed to enable racks and gears to be cut on a milling machine can be identified. Any accessories to be used in the manufacture of racks and gears and their function can be given.

Criteria 7.11A.3.2

Helical milling operations are performed, associated calculations are performed and relevant gear trains set up.

Assessor guide: observe that –

The relevant gear trains are correctly set up in accordance with calculations and standard operating procedures. Helical milling is performed to specification in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for carrying out helical milling operations can be given. The calculations to be performed to enable the helical milling operation to be undertaken can be identified. Any accessories to be used in the helical milling process and their function can be given.

Criteria 7.11A.3.3

Precision complex milling operations are performed using omniversal tables, differential dividing heads and the like as required.

Assessor guide: observe that –

Where appropriate, the relevant calculations to enable complex milling using omniversal tables and differential dividing heads are completed correctly. Where appropriate, complex milling using omniversal tables and differential dividing heads is performed to specification in accordance with standard operating procedures.

Assessor guide: confirm that –

The application of omniversal tables and differential dividing heads to complex milling operations can be identified. The calculations to be performed to enable complex milling involving omniversal tables and differential dividing heads can be identified. Any other accessories to be used in conjunction with the complex milling operations to be performed and their function can be given.

Range statement

This unit applies to a range of milling operations including those requiring complex calculations and jobs requiring high precision or quality using a range of materials including non-standard metals and alloy. Work is carried out autonomously to predetermined standards of quality and safety.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the performance of milling operations or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 7.12A A Complex grinding operations

Band – Specialisation band A

Field – Machine & process operations

Unit Weight 4

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices

9.2A Interpret technical drawing

7.5A Perform general machining

12.3A Precision mechanical measurement

7.8A Perform grinding operations

18.1A Use hand tools

Element 7.12A.1 Determine job requirements

Criteria 7.12A.1.1

Job requirements are determined from specifications and sequence of operations determined.

Assessor guide: observe that –

All relevant drawings, instructions and specifications are obtained in accordance with workplace procedures.

Assessor guide: confirm that –

The work to be undertaken can be identified. The sequence of operations to be performed can be identified. The specifications to be achieved can be identified.

Element 7.12A.2 Set up work

Criteria 7.12A.2.1

Grinding wheels are selected and dressed to form and size as required.

Assessor guide: observe that –

The grinding wheel selected is safely dressed to form and size required to carry out the grinding task in accordance with standard operating procedures.

Assessor guide: confirm that –

The standard grinding wheel shapes can be identified. A range of abrasive materials used in grinding wheels can be identified. The effect of the following grinding wheel features on wheel selection and application can be explained: - grain size of abrasive particles - grade or strength of bond - structure of grain spacing - bond material. The appropriate grinding wheel(s) for the given task(s) can be identified. The reasons for selecting the appropriate grinding wheel can be given. The procedures for dressing grinding wheels can be correctly identified. Grinding wheel dressing tools and their application can be identified. The appropriate grinding wheel dressing tool(s) for the given task(s) can be identified.

Criteria 7.12A.2.2

Work set up to required level of accuracy as per specifications.

Assessor guide: observe that –

The work is set up correctly and accurately in accordance with specifications and standard operating procedures.

Assessor guide: confirm that –

A variety of work holding devices/accessories appropriate to grinding tasks can be identified. The reasons for selecting the chosen work holding device/accessory can be explained. The tools, techniques and equipment required to set up the work to the required accuracy can be identified. The reasons for selecting the tools, techniques and equipment to be used to set up the work can be given.

Element 7.12A.3 Perform complex grinding**Criteria 7.12A.3.1**

Specialised grinding operations performed on components such as jigs, tools and dies, eccentrics, threads, gauge shapes and forms.

Assessor guide: observe that –

The specialised grinding task is completed in conformance with specifications and standard operating procedures.

Assessor guide: confirm that –

The procedures to be followed when carrying out the given specialised grinding task can be identified. The purpose of any accessories to be used while carrying out the specialised grinding process can be explained. The reasons for using accessories or specialised functions of the grinder can be given.

Element 7.12A.4 Check components for conformance to specification**Criteria 7.12A.4.1**

Components checked for conformance to specification using appropriate techniques, tools and equipment.

Assessor guide: observe that –

The ground components are checked for conformance with specifications in accordance with standard operating procedures.

Assessor guide: confirm that –

Tools, techniques and equipment appropriate to the checking of ground components for conformance with the following specifications can be identified: - dimensions and tolerances - geometry and tolerances - surface finish. The tools, techniques and equipment to be used to check the given ground components for conformance with specifications can be identified. The reasons for selecting the tools, techniques and equipment to be used can be explained.

Range statement

This unit may be applied to high precision operations such as jig grinding, grinding eccentrics, thread grinding, gauges, shapes and forms etc. Work includes the use of a range of precision measuring instruments. Grinding operations can be performed on a variety of materials to achieve high levels of precision for dimensions and finish. Work is carried out autonomously to predetermined standards of quality and safety.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with complex grinding operations or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 7.13A A Perform machining operations using horizontal and/or vertical boring machine

Band – Specialisation band A

Field – Machine & process operations

Unit Weight 4

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices
18.1A Use hand tools

7.5A Perform general machining

9.2A Interpret technical drawing

Element 7.13A.1 Observe safety precautions

Criteria 7.13A.1.1

Correct safety procedures observed and protective clothing and safety glasses worn.

Assessor guide: observe that –

Safety glasses and protective clothing is worn at all times.
The relevant safety procedures are followed at all times.

Assessor guide: confirm that –

Safety hazards associated with the use of horizontal and vertical boring machines can be identified.

Element 7.13A.2 Determine job requirements

Criteria 7.13A.2.1

Drawings interpreted, sequence of operations determined and tools selected to produce component to specification using International Standard Organisation or standard operating procedures.

Assessor guide: observe that –

All relevant drawings, job instructions and specifications are obtained in accordance with work place procedures.

Assessor guide: confirm that –

The job requirements can be identified. The sequence of operations to achieve the job requirements can be identified. The tool type and geometry to achieve the required specifications can be identified. The effect on tool type and geometry for work pieces of different materials can be given.

Criteria 7.13A.2.2

Cutting parameters determined.

Assessor guide: observe that –

Cutting feeds and speeds appropriate to the job are used.

Assessor guide: confirm that –

The cutting speeds and feeds appropriate to the job have been calculated. The consequences of varying speeds and feeds from the optimum rates calculated can be given. The effects of different materials on cutting speeds and feeds can be identified.

Element 7.13A.3 Perform boring operations**Criteria 7.13A.3.1**

Horizontal and vertical boring operations are carried out including parallel line and taper boring, facing, turning, drilling and reaming to drawing specifications.

Assessor guide: observe that –

Horizontal and/or vertical boring operations are carried out to specification in accordance with standard operating procedures for each of the following applications: - parallel boring - taper boring - facing - turning - drilling - reaming.

Assessor guide: confirm that –

The procedures and techniques for carrying out the following horizontal and vertical boring operations can be given: - parallel boring - taper boring - facing - turning - drilling - reaming. The accessories necessary to carry out the above operations and their function can be identified.

Element 7.13A.4 Check component for conformance to specification**Criteria 7.13A.4.1**

Components checked for conformance to specification using appropriate techniques, tools and equipment.

Assessor guide: observe that –

The bored components are checked for conformance to specification using appropriate tools, techniques and equipment in accordance with standard operating procedures.

Assessor guide: confirm that –

The appropriate tools, techniques and equipment to measure the bored components can be identified. The procedures for measuring bored components can be given.

Range statement

Work is performed to established processes, practices and standards of quality, safety and workshop procedures. Work is performed to drawings or sketches, specifications and instructions as appropriate. Work applies to a range of boring operations, using precision measuring instruments and standard engineering materials and cutting tools. Work is carried out autonomously to predetermined standards of quality and safety.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the performance of horizontal and vertical boring operations or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 7.14A A Perform electro-discharge machining operations

Band – Specialisation band A

Field – Machine & process operations

Unit Weight 4

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices

18.1A Use hand tools

7.5A Perform general machining

9.2A Interpret technical drawing

Pre-requisite units - Path 2

7.24A Operate and monitor machine/process

9.2A Interpret technical drawing

18.1A Use hand tools

Element 7.14A.1 Observe safety precautions

Criteria 7.14A.1.1

Correct safety procedures observed, protective clothing and safety glasses worn.

Assessor guide: observe that –

Safety glasses and protective clothing are worn at all times. The relevant safety procedures are followed at all times.

Assessor guide: confirm that –

Safety hazards associated with the use of electro-discharge machines can be identified.

Element 7.14A.2 Determine job requirements

Criteria 7.14A.2.1

Drawings interpreted, sequence of operations determined.

Assessor guide: observe that –

All relevant drawings, job instructions and specifications are obtained in accordance with work place procedures.

Assessor guide: confirm that –

The job requirements can be identified. The sequence of operations to achieve the job requirements can be identified.

Criteria 7.14A.2.2

Correct electrode selected to ensure finished component conforms to drawing specifications.

Assessor guide: observe that –

The correct electrode is used to ensure that the finished product conforms to specification.

Assessor guide: confirm that –

The electrode type and geometry required to achieve the specified outcome can be identified. The effects of material to be machined on the electrode material and geometry can be given.

Criteria 7.14A.2.3

Electrode surface area calculated and process parameters set to give safe, accurate and efficient operation.

Assessor guide: observe that –

Assessor guide: confirm that –

The procedures for producing electrodes for the electro-discharge machining process can be given. The surface area of the electrode is calculated. The machining parameters necessary to achieve the safe, accurate and efficient machining of the work piece are calculated/determined.

Element 7.14A.3 Set up job**Criteria 7.14A.3.1**

Job set up relative to electrode to ensure required position is obtained.

Assessor guide: observe that –

The work piece and electrode are appropriately positioned to enable the safe, accurate and efficient machining of the required feature(s).

Assessor guide: confirm that –

The coordinates of the work pieces relative to the machine datum are determined. The coordinates of the feature(s) to be machined can be identified. The coordinates of the electrode relative to the machine datum can be identified.

Element 7.14A.4 Perform electro-discharge (EDM)**Criteria 7.14A.4.1**

Electro-discharge machine operated to produce components to drawing specifications.

Assessor guide: observe that –

Components are produced to specification using the electro-discharge machining process in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for operating the electro-discharge machine to produce components can be given.

Element 7.14A.5 Check components for conformance to specification**Criteria 7.14A.5.1**

Components are checked for conformance to specification using appropriate techniques, tools and equipment.

Assessor guide: observe that –

The machined components are checked for conformance with specifications in accordance with standard operating procedures.

Assessor guide: confirm that –

The tools, techniques and equipment appropriate to the checking of machined components can be identified. The procedures for checking machined components for conformance to specification can be given. The reasons for selecting the tools, techniques and equipment to be used can be explained.

Range statement

This unit covers the skills required to use an electro-discharge machine (EDM). Work is performed to established processes, practices and standards of quality, safety and workshop procedures. Work applies to a range of electro-discharge machining (EDM) operations and engineering materials. Work is performed to drawings and sketches, specifications and instructions as appropriate. For electrode manufacture other appropriate machining units should be accessed.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the performance of electro-discharge machining operations or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 7.15A A Set NC/CNC machine/process (basic)

Band – Specialisation band A

Field – Machine & process operations

Unit Weight 2

This unit covers the competencies required to mount work holding fixtures/devices/tools, conduct pre-start checks, set NC/CNC machine, instruct the operator and replace worn or damaged tooling. The unit applies to the setting of any NC/CNC machines.

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices
9.2A Interpret technical drawing

7.24A Operate and monitor machine/process
18.1A Use hand tools

7.28A Operate NC/CNC machine/process (basic)

Pre-requisite units - Path 2

2.5C11 Measure with graduated devices
18.1A Use hand tools

7.5A Perform general machining

9.2A Interpret technical drawing

Pre-requisite units - Path 3

2.5C11 Measure with graduated devices
9.1A Draw and interpret sketch

7.24A Operate and monitor machine/process
18.1A Use hand tools

7.28A Operate NC/CNC machine/process (basic)

Element 7.15A.1 Obtain job instructions

Criteria 7.15A.1.1

Job sheets or equivalent instructions understood and correctly followed

Assessor guide: observe that –

Job sheets and/or instructions are obtained in accordance with work place procedures

Assessor guide: confirm that –

The work to be undertaken can be identified

Element 7.15A.2 Mount work holding fixtures/devices/tools

Criteria 7.15A.2.1

Machine prepared to accept work holding fixtures/devices/tools

Assessor guide: observe that –

The machine is prepared for the installation/mounting of appropriate work holding fixtures/devices/tools as required in accordance with standard operating

Assessor guide: confirm that –

The work holding fixtures/devices/ tools appropriate to the NC/CNC machine/process can be identified The correct work holding fixtures/ devices/tools for the given task(s) can be identified The reasons for selecting the work holding fixtures/devices/tools chosen can be given The procedures for mounting work holding fixtures/devices/tools can be identified

Criteria 7.15A.2.2

Pre-set tooling is mounted as required into machine/equipment

Assessor guide: observe that –

Appropriate pre-set tooling is mounted in the machine in accordance with standard operating procedures

Assessor guide: confirm that –

The pre-set tooling available for use in conjunction with the given NC/CNC machine/process can be identified The correct pre-set tooling for the given task(s) can be identified The reasons for selecting the pre-set tooling chosen can be given The procedures for mounting pre-set tooling can be identified

Criteria 7.15A.2.3

Work holding fixtures/devices are set on machine as required using standard operating procedures

Assessor guide: observe that –

Appropriate work holding fixtures/ devices/tools are located and mounted on the machine as required in accordance with specifications and standard operating procedures

Assessor guide: confirm that –

The location of the required work holding fixtures/devices/tools relative to the machine datum or zero can be correctly identified

Criteria 7.15A.2.4

Tool offset or datum settings are identified/verified against job sheet using standard operating procedures

Assessor guide: observe that –

Tool offsets and/or datum settings are verified against job sheets or instructions in accordance with standard operating procedures

Assessor guide: confirm that –

The reasons for establishing tool offsets can be explained The purpose of datum settings can be explained The tool offsets and/or datum settings for the given task(s) can be correctly identified The source(s) of information on tool offsets and datum settings can be identified

Criteria 7.15A.2.5

NC/CNC program loaded, selected and verified in accordance with job instructions

Assessor guide: observe that –

The NC/CNC program is loaded in accordance with standard operating procedures The NC/CNC program loaded is verified in accordance with standard operating procedures

Assessor guide: confirm that –

The NC/CNC program appropriate to the given task(s) is identified The source(s) of NC/CNC programs can be identified The procedures for loading NC/CNC programs can be identified The procedures for verifying loaded NC/CNC programs can be identified

Element 7.15A.3 Conduct pre-start checks**Criteria 7.15A.3.1**

Pre-start checks undertaken to standard operating procedure

Assessor guide: observe that –

All pre-start checks are undertaken safely in accordance with standard operating procedures

Assessor guide: confirm that –

The pre-start checks to be undertaken can be identified

Criteria 7.15A.3.2

Correct safety procedures are observed and all safety equipment checked for correct operation

Assessor guide: observe that –

Correct safety procedures are followed at all times All safety features and equipment are checked for correct operation in accordance with standard operating procedures

Assessor guide: confirm that –

The safety features and equipment of the NC/CNC machine/process can be identified The purpose and function of the safety features and/or equipment can be explained

Element 7.15A.4 Set NC/CNC (numerical control/computer numerical control) machine**Criteria 7.15A.4.1**

Machine set/adjusted to meet operational requirements and specifications

Assessor guide: observe that –

The NC/CNC machine/process is set in accordance with specifications and standard operating procedures Where appropriate the NC/CNC machine/process is adjusted to meet specifications and operational requirements in accordance with standard operating procedures

Assessor guide: confirm that –

The machine/process setting procedures can be identified The relevant machine and operational specifications can be identified The adjustments that can be made to the machine/process can be identified The effect of adjustments on machine and operational specifications can be explained

Criteria 7.15A.4.2

Production samples checked for compliance with specifications using standard operating procedures

Assessor guide: observe that –

The first-off samples are measured for compliance with specifications in accordance with standard operating procedures

Assessor guide: confirm that –

The specifications of the parts or product to be produced can be identified The appropriate measuring devices for use in checking the parts or product can be identified

Element 7.15A.5 Instruct machine operator**Criteria 7.15A.5.1**

Operator instructed if necessary ensuring that all safety procedures and devices are in place

Assessor guide: observe that –

Where appropriate, the machine operator is instructed on the sequence of operations, any required safety procedures and the standard operating procedures to be observed All safety procedures and devices are in place and operational

Assessor guide: confirm that –

The sequence of operations of the NC/CNC machine/process can be identified All safety features, devices and equipment associated with the NC/CNC machine/process and their function can be identified The standard operating procedures applicable to the machine/process can be identified

Element 7.15A.6 Replace worn/damaged tooling**Criteria 7.15A.6.1**

Where appropriate, preset tools are replaced, tool offsets adjusted or other corrective action taken using standard operating procedures

Assessor guide: observe that –

Where appropriate, worn or damaged tooling is identified and appropriate corrective action taken in accordance with standard operating procedures

Assessor guide: confirm that –

Common examples of worn or damaged tooling can be identified The effect of worn or damaged tooling on the part or product to be produced can be explained The corrective action to be taken when worn or damaged tools are detected can be identified The procedures for adjusting tool offsets can be given

Range statement

Work applies to setting any NC/CNC (numerical control/computer numerical control) machines. Work is performed to established processes, practices and specifications and instructions as appropriate. Technical difficulties are resolved in consultation with appropriate technical advisers. Work is carried out autonomously using predetermined standards of quality and safety. For setting non-NC/CNC machines or processes, refer to Unit 7.3A (Setting machines (routine)).

Evidence**Assessment context**

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the setting of NC/CNC machines and/or processes or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 7.16A B Set and edit NC/CNC machine/process

Band – Specialisation band A

Field – Machine & process operations

Unit Weight 4

This unit covers the competencies required to mount work holding fixtures/devices/tools, set tooling offsets, trial the NC/CNC program, instruct the operator and replace worn or damaged tooling. The unit applies to any NC/CNC machine or process. Editing applies to identifying and accessing NC/CNC programs in edit mode in order to make changes associated with speeds, feed and operational sequence.

Note - This unit has dual status and is to be regarded as both a Specialisation band A unit and Specialisation band B unit for progression to C7 (AQF level IV)

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices

7.28A Operate NC/CNC machine/process (basic)

7.15A Set NC/CNC machines/process (basic)

9.2A Interpret technical drawing

7.24A Operate and monitor machine/process

18.1A Use hand tools

Pre-requisite units - Path 2

2.5C11 Measure with graduated devices

9.2A Interpret technical drawing

7.5A Perform general machining

18.1A Use hand tools

7.15A Set NC/CNC machines/process (basic)

Pre-requisite units - Path 3

2.5C11 Measure with graduated devices

5.9A Automated thermal cutting

5.7A Manual heating and thermal cutting

9.2A Interpret technical drawing

5.8A Advanced manual thermal cutting, gouging and shaping

18.1A Use hand tools

Element 7.16A.1 Identify job requirements

Criteria 7.16A.1.1

Instructions/plans understood and correctly followed

Assessor guide: observe that –

Job sheets and/or instructions are obtained in accordance with work place procedures

Assessor guide: confirm that –

The work to be undertaken can be identified The specifications to be achieved can be identified

Element 7.16A.2 Set work holding fixtures/devices/tools

Criteria 7.16A.2.1

Correct ancillary devices selected and attached to machine using standard operating procedures

Assessor guide: observe that –

Where appropriate, the correct ancillary devices are attached to the NC/CNC machine in accordance with standard operating procedures

Assessor guide: confirm that –

The ancillary equipment available for use in conjunction with the NC/CNC machine/process can be identified The correct ancillary equipment is selected for the task(s) to be performed The reasons for selecting the chosen equipment can be explained The procedures for attaching the ancillary device(s) to the NC/CNC machine can be given

<p>Criteria 7.16A.2.2 Machine prepared to accept work holding devices appropriate work holding devices as required in accordance</p>	<p><i>Assessor guide: observe that –</i> The machine is prepared for the installation/mounting of with standard operating procedures</p>	<p><i>Assessor guide: confirm that –</i> The work holding devices appropriate to the NC/CNC machine/process can be identified The correct work holding devices for the given task(s) can be identified The reasons for selecting the work holding device(s) chosen can be given The procedures for mounting work holding devices can be identified</p>
<p>Criteria 7.16A.2.3 Work holding fixtures/devices/tools are set to zero or a datum using appropriate setting devices</p>	<p><i>Assessor guide: observe that –</i> Appropriate work holding devices are located and mounted on the machine as required in accordance with specifications and standard operating procedures</p>	<p><i>Assessor guide: confirm that –</i> The location of the required work holding fixtures/devices/tools relative to the machine zero or datum can be correctly identified</p>
<p>Element 7.16A.3 Set tooling offsets</p>		
<p>Criteria 7.16A.3.1 Tooling offsets are measured and recorded in machine controller</p>	<p><i>Assessor guide: observe that –</i> Tool offsets are accurately measured in accordance with standard operating procedures Tool offsets entered into the NC/CNC machine/process controller are verified in accordance with standard operating procedures</p>	<p><i>Assessor guide: confirm that –</i> The reasons for establishing tool offsets can be explained The procedures for measuring tool offsets can be given The procedures for entering and verifying tool offsets in the NC/CNC machine/process controller can be given The measuring techniques/equipment to be used to determine tool offsets can be identified</p>
<p>Element 7.16A.4 Trial NC/CNC program</p>		
<p>Criteria 7.16A.4.1 Machine operated to produce first-off samples observing all safety procedures</p>	<p><i>Assessor guide: observe that –</i> First-off samples are produced safely in accordance with standard operating procedures</p>	<p><i>Assessor guide: confirm that –</i> The operating procedures applicable to the NC/CNC machine/process can be identified All safety features and equipment associated with the NC/CNC machine/process and its function can be identified</p>
<p>Criteria 7.16A.4.2 First-off samples checked for compliance with specifications</p>	<p><i>Assessor guide: observe that –</i> First-off samples are measured and checked for compliance with specifications in accordance with standard operating procedures</p>	<p><i>Assessor guide: confirm that –</i> The specifications of the parts or products to be produced can be identified The appropriate measuring devices/ techniques for use in checking the parts or product can be identified</p>
<p>Criteria 7.16A.4.3 Program editing to change speeds, feed and operational sequence requirements undertaken as required to ensure job conforms to specification</p>	<p><i>Assessor guide: observe that –</i> Where appropriate, the NC/CNC program is edited via the machine/ process controller to ensure the part or product conforms to specification</p>	<p><i>Assessor guide: confirm that –</i> The effects of changes to cutting feeds and speeds on the part or product to be produced can be explained The impact of changes to the sequence of operations on the part or product to be produced can be explained The procedures for editing NC/CNC programs via the machine controller can be explained</p>

Element 7.16A.5 Instruct machine operator**Criteria 7.16A.5.1**

Operator instructed if necessary ensuring that all safety procedures and devices are in place

Assessor guide: observe that –

Where appropriate, the machine operator is instructed on the sequence of operations, any required safety procedures and the standard operating procedures to be observed All safety procedures and devices are in place and operational

Assessor guide: confirm that –

The sequence of operations of the NC/CNC machine/process can be identified All safety features, devices and equipment associated with the NC/CNC machine/process and their function can be identified The standard operating procedures applicable to the

Element 7.16A.6 Replace worn or damaged tooling**Criteria 7.16A.6.1**

Where appropriate, tools are replaced, tool offsets adjusted or other corrective action taken using standard operating procedures

Assessor guide: observe that –

Where appropriate, worn or damaged tooling is identified and appropriate corrective action taken in accordance with standard operating procedures

Assessor guide: confirm that –

Common examples of worn or damaged tooling can be identified The effect of worn or damaged tooling on the part or product to be produced can be explained The corrective action to be taken when worn or damaged tools are detected can be identified The procedures for adjusting tool offsets can be given

Range statement

Work is performed to established processes, practices and specifications. Work applies to any NC/CNC machine, machining process or operation. Machine operations may include welding, thermal cutting, metal cutting, forming and shaping etc. All work and work practices are performed to instructions, plans and specifications as appropriate. Technical difficulties are resolved in consultation with appropriate technical advisers. Work is carried out autonomously to predetermined standards of quality and safety. Editing applies to identifying and accessing NC/CNC programs in edit mode in order to make changes associated with speeds, feed and operational sequence. Changes are generally made in situ. Where additional machining skills in excess of Unit 7.5A (Perform general machining) are required then appropriate units should also be selected.

Evidence guide**Assessment context**

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the setting and editing of NC/CNC machines and/or processes or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 7.18A B Basic NC/CNC programming

Band – Specialisation band A

Field – Machine & process operations

Unit Weight 4

This unit covers the competencies required to identify basic NC/CNC machine program elements, write a basic NC/CNC machine program and operation sheet and trial the program. This unit extends to writing a basic program to describe simple machine operations including tool paths using appropriate software for machines which may incorporate single spindles, single tools turrets, B axis angular, tool changers, component loaders of a pallet type but excludes multiple spindles.

Note - This unit has dual status and is to be regarded as both a Specialisation band A unit and Specialisation band B unit for progression to C7 (AQF level IV)

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices
7.24A Operate and monitor machine/process
18.1A Use hand tools

7.15A Set NC/CNC machines/process (basic)
7.28A Operate NC/CNC machine/process (basic)

7.16A Set and edit NC/CNC machine/process
9.2A Interpret technical drawing

Pre-requisite units - Path 2

2.5C11 Measure with graduated devices
7.16A Set and edit NC/CNC machine/process

7.5A Perform general machining
9.2A Interpret technical drawing

7.15A Set NC/CNC machines/process (basic)
18.1A Use hand tools

Pre-requisite units - Path 3

2.5C11 Measure with graduated devices

5.7A Manual heating and thermal cutting

5.8A Advanced manual thermal cutting, gouging and shaping

5.9A Automated thermal cutting
9.2A Interpret technical drawing

7.15A Set NC/CNC machines/process (basic)
18.1A Use hand tools

7.16A Set and edit NC/CNC machine/process

Element 7.18A.1 Identify basic NC/CNC machine program elements

Criteria 7.18A.1.1

Appropriate program elements are selected for machine controller

Assessor guide: observe that –

Assessor guide: confirm that –

The elements of a basic NC/CNC program can be identified
The function of those elements in controlling the operation of an NC/ CNC machine can be explained

Element 7.18A.2 Write basic NC/CNC machine program**Criteria 7.18A.2.1**

Engineering drawings understood and interpreted to define basic machine function and tool path geometry

Assessor guide: observe that –

All relevant engineering drawings, specifications and instructions are obtained in accordance with work place procedures

Assessor guide: confirm that –

The machining operations to be performed in the manufacture of the given part or product can be identified The appropriate type(s) of NC/CNC machine to perform the required machining operations can be identified The machining operations to be controlled by the program to be written can be identified The tool path(s) to be followed when producing the part or product can be identified The sequence of machining operations to be programmed can be identified The reasons for selecting the chosen tool path(s) and sequence of operations can be explained

Criteria 7.18A.2.2

Coordinates calculated for simple tool path or basic machining functions

Assessor guide: observe that –

The coordinates of all relevant points on the part or product to be produced are calculated accurately

Assessor guide: confirm that –

The zero point of the NC/CNC machine can be identified

Criteria 7.18A.2.3

Program written in standard code format in accordance with standard operating procedures

Assessor guide: observe that –

An appropriate NC/CNC program is written in standard code format in accordance with standard operating procedures

Assessor guide: confirm that –

The standard codes used in the writing of NC/CNC programs can be identified The applications of standard codes in NC/CNC programming can be explained The procedures for writing NC/CNC programs in standard code format can be given

Element 7.18A.3 Write NC/CNC operation sheet**Criteria 7.18A.3.1**

Operation sheets produced to specification in accordance with standard operating procedures

Assessor guide: observe that –

All relevant information is included in the NC/CNC operation sheet(s) The NC/CNC operation sheet(s) are produced in accordance with specifications and standard operating procedures

Assessor guide: confirm that –

The procedures for completing NC/CNC operation sheets can be given The information to be included in NC/CNC operation sheets can be identified

Element 7.18A.4 Trial program**Criteria 7.18A.4.1**

Machine operated in manual mode to test and prove program as required

Assessor guide: observe that –

The NC/CNC machine is operated safely in manual mode in accordance with standard operating procedures

Assessor guide: confirm that –

The procedures for manual operation of the NC/CNC machine can be identified The reasons for testing and proving the NC/CNC program can be explained

Criteria 7.18A.4.2

Program is edited if necessary to adjust operation as required

Assessor guide: observe that –

Where appropriate the NC/CNC program is edited in accordance with standard operating procedures

Assessor guide: confirm that –

The procedures for editing the NC/CNC program via the machine controller can be given The effects of editing on the operation of the NC/CNC machine and the part or product to be produced can be explained

Criteria 7.18A.4.3

Components are checked for conformance to specification as required

Assessor guide: observe that –

The parts or products produced are checked for conformance with specifications in accordance with standard operating procedures

Assessor guide: confirm that –

The specifications of the part or product can be identified The measuring equipment/techniques to be used to check for conformance to specification can be identified

Range statement

Extends to writing a basic program to describe simple machine operations, including tool paths using appropriate software, machine operations may include welding, thermal cutting, metal cutting, forming and shaping etc. Machines may incorporate single spindles, single tool turrets, B axis angular, tool changers, component loaders of a pallet type etc., but excludes multiple spindles. Programs are trialed and edited as necessary to adjust operation of machine. Technical difficulties are resolved in consultation with appropriate technical advisers. Work would be undertaken autonomously using predetermined standards of quality. The program may use common M and G codes but does not include the programming of advanced operations, using canned cycles and sub-routines. For this level of programming, see Unit 7.19A (Program NC/CNC machining centre). Where additional machining skills in excess of Unit 7.5A (Perform general machining) are required then appropriate units should also be selected.

Evidence guide**Assessment context**

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with basic NC/CNC programming and/or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 7.19A B Program NC/CNC machining centre

Band – Specialisation band A

Field – Machine & process operations

Unit Weight 2

This unit covers the competencies required to identify basic NC/CNC machine program elements, write a basic NC/CNC machine program and operation sheet and trial

the program. This unit extends to writing a basic program to describe machine operations including tool paths using appropriate software for machines which may incorporate single spindles, single tools turrets, B axis angular, tool changers, component loaders of a pallet types but excludes multiple spindle and multiple axis.

Note - Where machining skills in excess of Unit 7.5A (Perform general machining) are required then appropriate units should also be selected This unit has dual status

and is to be regarded as both a Specialisation band A unit and Specialisation band B unit for progression to C7 (AQF level IV)

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices

7.18A Basic NC/CNC programming

9.2A Interpret technical drawing

7.15A Set NC/CNC machines/process (basic)

7.24A Operate and monitor machine/process

18.1A Use hand tools

7.16A Set and edit NC/CNC machine/process

7.28A Operate NC/CNC machine/process (basic)

Pre-requisite units - Path 2

2.5C11 Measure with graduated devices

7.16A Set and edit NC/CNC machine/process

18.1A Use hand tools

7.5A Perform general machining

7.18A Basic NC/CNC programming

7.15A Set NC/CNC machines/process (basic)

9.2A Interpret technical drawing

Pre-requisite units - Path 3

2.5C11 Measure with graduated devices

5.9A Automated thermal cutting

9.2A Interpret technical drawing

5.7A Manual heating and thermal cutting

7.16A Set and edit NC/CNC machine/process

18.1A Use hand tools

5.8A Advanced manual thermal cutting, gouging and shaping

7.18A Basic NC/CNC programming

Element 7.19A.1 Identify basic NC/CNC machine program elements

Criteria 7.19A.1.1

Appropriate program elements are selected for machine controller

Assessor guide: observe that –

Assessor guide: confirm that –

The elements of an NC/CNC program can be identified The function of those elements in controlling the operation of an NC/ CNC machine can be explained

Element 7.19A.2 Write basic NC/CNC machine program**Criteria 7.19A.2.1**

Engineering drawings understood and interpreted to define machine function and tool path geometry

Assessor guide: observe that –

All relevant engineering drawings, specifications and instructions are obtained in accordance with work place procedures

Assessor guide: confirm that –

The machining operations to be performed in the manufacture of the given part or product can be identified The appropriate type(s) of NC/CNC machine to perform the required machining operations can be identified The machining operations to be controlled by the program to be written can be identified The tool path(s) to be followed when producing the part or product can be identified The sequence of machining operations to be programmed can be identified The reasons for selecting the chosen tool path(s) and sequence of operations can be explained

Criteria 7.19A.2.2

Coordinates calculated as required for tool path or machine functions

Assessor guide: observe that –

The coordinates of all relevant points on the part or product to be produced are calculated accurately

Assessor guide: confirm that –

The zero point of the NC/CNC machine can be identified

Criteria 7.19A.2.3

Advanced operations using canned cycles and sub-routines are selected and applied appropriately

Assessor guide: observe that –

Assessor guide: confirm that –

The canned cycles and sub-routines accessible in the particular NC/CNC machine can be identified The application of each canned cycle and sub-routine available can be given Where appropriate the canned cycles and/or sub-routines to be used in the NC/CNC program can be identified The reasons for selecting the chosen canned cycles and/or sub-routines can be explained

Criteria 7.19A.2.4

Program written in standard code format in accordance with standard operating procedures

Assessor guide: observe that –

An appropriate NC/CNC program is written in standard code format and incorporating, where appropriate, canned cycles and sub-routines

Assessor guide: confirm that –

The standard codes used in the writing of NC/CNC programs can be identified The applications of standard codes in NC/CNC programming can be explained The procedures for writing NC/CNC programs in standard code format can be given

Element 7.19A.3 Write NC/CNC operation sheet**Criteria 7.19A.3.1**

Operation sheets produced to specification in accordance with standard operating procedure which includes appropriate Australian Standard where required

Assessor guide: observe that –

All relevant information is included in the NC/CNC operation sheet(s) The NC/CNC operation sheet(s) are produced in accordance with specifications and standard operating procedures

Assessor guide: confirm that –

The procedures for completing NC/CNC operation sheets can be given The information to be included in NC/CNC operation sheets can be identified Where appropriate, relevant Australian Standards can be identified

Element 7.19A.4 Trial program**Criteria 7.19A.4.1**

Machine operated in manual mode to test and prove program

Assessor guide: observe that –

The NC/CNC machine is operated safely in manual mode in accordance with standard operating procedures

Assessor guide: confirm that –

The procedures for manual operation of the NC/CNC machine can be identified The reasons for testing and proving the NC/CNC program can be explained

Criteria 7.19A.4.2

Program is edited if necessary to adjust operation accordance with standard operating procedures

Assessor guide: observe that –

Where appropriate the NC/CNC program is edited in machine controller can be given The effects of editing on

Assessor guide: confirm that –

The procedures for editing the NC/CNC program via the operation of the NC/CNC machine and the part or product to be produced can be explained

Criteria 7.19A.4.3

Components are checked to conform to specification

Assessor guide: observe that –

The parts or products produced are checked for conformance with specifications in accordance with standard operating procedures

Assessor guide: confirm that –

The specifications of the part or product can be identified The measuring equipment/techniques to be used to check for conformance with specifications can be identified

Range statement

Extends to writing programs to describe machine operations including tool paths using appropriate software for machines which may incorporate single spindles, single tool turrets, tool changers, B axis angular, component loaders of the pallet type etc., but excludes multiple spindles and multiple axis. The program may use common M and G codes and includes the programming of advanced operations, using canned cycles and sub-routines. Programs are trialed and edited as necessary to adjust operation of centre. Technical difficulties are resolved in consultation with appropriate technical advisers. Work would be undertaken autonomously using predetermined standards of quality.

Evidence guide**Assessment context**

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the programming of NC/CNC machining centres or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 7.20A B Program multiple spindle and/or multiple axis NC/CNC machining centre

Band – Specialisation band A

Field – Machine & process operations

Unit Weight 2

This unit covers the competencies required to identify basic NC/CNC machine program elements, write a basic NC/CNC machine program and operation sheet and trial

the program. This unit extends to writing a basic program to describe machine operations including tool paths using appropriate software for machines which may incorporate multiple spindles, multiple axis/B axis angular, multiple tool turrets, tool changers, component loaders of a pallet types but excludes multiple spindles and multiple axis.

Note - This unit has dual status and is to be regarded as both a Specialisation band A unit and Specialisation band B unit for progression to C7 (AQF level IV)

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices

7.18A Basic NC/CNC programming

7.28A Operate NC/CNC machine/process (basic)

7.15A Set NC/CNC machines/process (basic)

7.19A Program NC/CNC machining centre

9.2A Interpret technical drawing

7.16A Set and edit NC/CNC machine/process

7.24A Operate and monitor machine/process

18.1A Use hand tools

Pre-requisite units - Path 2

2.5C11 Measure with graduated devices

7.16A Set and edit NC/CNC machine/process

9.2A Interpret technical drawing

7.5A Perform general machining

7.18A Basic NC/CNC programming

18.1A Use hand tools

7.15A Set NC/CNC machines/process (basic)

7.19A Program NC/CNC machining centre

Pre-requisite units - Path 3

2.5C11 Measure with graduated devices

5.9A Automated thermal cutting

7.19A Program NC/CNC machining centre

5.7A Manual heating and thermal cutting

7.16A Set and edit NC/CNC machine/process

9.2A Interpret technical drawing

5.8A Advanced manual thermal cutting, gouging and shaping

7.18A Basic NC/CNC programming

18.1A Use hand tools

Element 7.20A.1 Identify basic NC/CNC machine program elements

Criteria 7.20A.1.1

Appropriate program elements are selected for machine controller

Assessor guide: observe that –

Assessor guide: confirm that –

The elements of an NC/CNC program can be identified The function of those elements in controlling the operation of an NC/ CNC machine can be explained

Element 7.20A.2 Write basic NC/CNC machine program**Criteria 7.20A.2.1**

Engineering drawings understood and interpreted to define machine function and tool path geometry

Assessor guide: observe that –

All relevant engineering drawings, specifications and instructions are obtained in accordance with work place procedures

Assessor guide: confirm that –

The machining operations to be performed in the manufacture of the given part or product can be identified The appropriate type(s) of NC/CNC machine to perform the required machining operations can be identified The machining operations to be controlled by the program to be written can be identified The tool path(s) to be followed when producing the part or product can be identified The sequence of machining operations to be programmed can be identified The reasons for selecting the chosen tool path(s) and sequence of operations can be explained

Criteria 7.20A.2.2

Coordinates calculated as required for tool path or machine functions

Assessor guide: observe that –

The coordinates of all relevant points on the part or product to be produced are calculated accurately

Assessor guide: confirm that –

The zero point of the NC/CNC machine can be identified

Criteria 7.20A.2.3

Advanced operations using canned cycles and sub-routines are selected and applied appropriately

Assessor guide: observe that –

Assessor guide: confirm that –

The canned cycles and sub-routines accessible in the particular NC/CNC machine can be identified The application of each canned cycle and sub-routine available can be given Where appropriate the canned cycles and/or sub-routines to be used in the NC/CNC program can be identified The reasons for selecting the chosen canned cycles and/or sub-routines can be explained

Criteria 7.20A.2.4

Program written in standard code format in accordance with standard operating procedures

Assessor guide: observe that –

An appropriate NC/CNC program is written in standard code format and incorporating, where appropriate, canned cycles and sub-routines

Assessor guide: confirm that –

The standard codes used in the writing of NC/CNC programs can be identified The applications of standard codes in NC/CNC programming can be explained The procedures for writing NC/CNC programs in standard code format can be given

Element 7.20A.3 Write NC/CNC operation sheet**Criteria 7.20A.3.1**

Operation sheets produced to specification in accordance with standard operating procedure which includes appropriate Australian Standard where required

Assessor guide: observe that –

All relevant information is included in the NC/CNC operation sheet(s) The NC/CNC operation sheet(s) are produced in accordance with specifications and standard operating procedures

Assessor guide: confirm that –

The procedures for completing NC/CNC operation sheets can be given The information to be included in NC/CNC operation sheets can be identified Where appropriate, relevant Australian Standards can be identified

Element 7.20A.4 Trial program**Criteria 7.20A.4.1**

Machine operated in manual mode to test and prove program

Assessor guide: observe that –

The NC/CNC machine is operated safely in manual mode in accordance with standard operating procedures

Assessor guide: confirm that –

The procedures for manual operation of the NC/CNC machine can be identified The reasons for testing and proving the NC/CNC program can be explained

Criteria 7.20A.4.2

Program is edited if necessary to adjust operation accordance with standard operating procedures

Assessor guide: observe that –

Where appropriate the NC/CNC program is edited in machine controller can be given The effects of editing on

Assessor guide: confirm that –

The procedures for editing the NC/CNC program via the

the operation of the NC/CNC machine and the part or product to be produced can be explained

Criteria 7.20A.4.3

Components are checked to conform to specification

Assessor guide: observe that –

The parts or products produced are checked for conformance with specifications in accordance with standard operating procedures

Assessor guide: confirm that –

The specifications of the part or product can be identified

The measuring equipment/techniques to be used to check for conformance with specifications can be identified

Range statement

Extends to writing programs to describe machine operations including tool paths using appropriate software for machines which include multiple spindles and/or multiple axis/B axis angular, multiple tool turrets, tool changers and may include component loaders of a pallet type etc. The program may use common M and G codes and includes the programming of advanced operations, using canned cycles and sub-routines. Programs are trialed and edited as necessary to adjust operation of centre. Technical difficulties are resolved in consultation with appropriate technical advisers. Work would be undertaken autonomously using predetermined standards of quality. Where machining skills in excess of 7.5A (Perform general machining) are required then appropriate units should also be selected.

Evidence guide**Assessment context**

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the programming of multiple spindle, multiple axis NC/CNC machining centres or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 7.21A A Perform complex lathe operations

Band – Specialisation band A

Field – Machine & process operations

Unit Weight 4

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices

2.13C5 Perform mathematical computations

9.2A Interpret technical drawing

2.7C10 Perform computations - basic

7.5A Perform general machining

12.3A Precision mechanical measurement

2.8C10 Perform computations

7.6A Perform lathe operations

18.1A Use hand tools

Element 7.21A.1 Accurately set up work

Criteria 7.21A.1.1

Work is set up to required level of accuracy using precision instruments such as dial test indicators etc.

Assessor guide: observe that –

The work is set up to the required level of accuracy using appropriate precision measuring equipment in accordance with standard operating procedures.

Assessor guide: confirm that –

The precision measuring equipment appropriate to the accuracy required in setting up the work can be identified. The reasons for selecting the chosen measuring equipment can be given. The procedures for accurately setting up the work can be given.

Element 7.21A.2 Identify inserts from International Standard Organisation or other appropriate standards

Criteria 7.21A.2.1

Correct tool is selected using International Standard Organisation standards or other appropriate standards to suit cutting parameters.

Assessor guide: observe that –

The correct cutting tool inserts are selected for the cutting parameters in accordance with ISO standards.

Assessor guide: confirm that –

The ISO standards applicable to cutting tool inserts can be identified. The cutting parameters for the work to be undertaken can be determined.

Element 7.21A.3 Perform complex turning

Criteria 7.21A.3.1

Speeds and feeds are correctly calculated using appropriate mathematical techniques and reference material.

Assessor guide: observe that –

The appropriate feeds and speeds are used in performing complex turning operations.

Assessor guide: confirm that –

The appropriate feeds and speeds for complex turning operation(s) are correctly calculated. The sources of appropriate formulae and data relating to feeds and speeds can be identified.

Criteria 7.21A.3.2

Complex turning undertaken which may include single and multi-start thread cutting, internal blind hole thread cutting, eccentrics, copy and taper turning etc.

Assessor guide: observe that –

Complex turning operations are performed to specification in accordance with standard operating procedures.

Assessor guide: confirm that –

The techniques and procedures for carrying out each of the following turning operations can be given: - single start thread cutting - multi-start thread cutting - internal blind hole thread cutting - eccentrics - copy turning - taper turning.

Criteria 7.21A.3.3

Non-standard turning operations performed as required which may include counterbalancing work on face plates, mandrill work, trepanning, heavy (multi-tonne) shafts etc.

Assessor guide: observe that –

Where appropriate, the following turning operations are performed to specification in accordance with standard operating procedures: - counter balancing work on face plates - mandrill work - trepanning - heavy (multi-tonne) shafts.

Assessor guide: confirm that –

The techniques and procedures for carrying out each of the following turning operations can be given: - counter balancing work on face plates - mandrill work - trepanning - heavy (multi-tonne) shafts.

Range statement

The skills in this unit are applied to more unusual or difficult turning operations including those requiring calculations, or jobs requiring high precision or quality using a range of materials including non-standard metals and alloys. Work would be performed autonomously using predetermined standards of quality and safety. Skills in this unit are applied to complex or unusual turning operations including the use of special tools or techniques and where the outcomes require high precision. A variety of materials may be used including non-standard metals and alloys.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the performance of complex lathe operations or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 7.22A B Advanced programming of CNC wire cut machines

Band – Specialisation band A

Field – Machine & process operations

Unit Weight 2

This unit covers the competencies required to write and trial a program for a range of CNC wire cut machines. Programming includes 2 axis tool paths, 4 axis conical cutting, auto multi-cavity work pieces.

Note - This unit has dual status and is to be regarded as both a Specialisation band A unit and Specialisation band B unit for progression to C7 (AQF level IV)

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices
7.16A Set and edit NC/CNC machine/process
18.1A Use hand tools

7.5A Perform general machining
7.18A Basic NC/CNC programming

7.15A Set NC/CNC machines/process (basic)
9.2A Interpret technical drawing

Pre-requisite units - Path 2

2.5C11 Measure with graduated devices
7.18A Basic NC/CNC programming
9.2A Interpret technical drawing

7.15A Set NC/CNC machines/process (basic)
7.24A Operate and monitor machine/process
18.1A Use hand tools

7.16A Set and edit NC/CNC machine/process
7.28A Operate NC/CNC machine/process (basic)

Pre-requisite units - Path 3

2.5C11 Measure with graduated devices

7.16A Set and edit NC/CNC machine/process
18.1A Use hand tools

5.8A Advanced manual thermal cutting, gouging and shaping
7.18A Basic NC/CNC programming

5.9A Automated thermal cutting
9.2A Interpret technical drawing

Element 7.22A.1 Write program

Criteria 7.22A.1.1

Engineering drawings understood and interpreted to define optimum tool path geometry

Assessor guide: observe that –

All relevant drawings, specifications and instructions are obtained in accordance with work place procedures The coordinates of all relevant points on the part or product to be produced are calculated accurately

Assessor guide: confirm that –

The operations to be performed in producing the given part or product can be identified The operations to be controlled by the program to be written can be identified The tool path(s) to be followed when producing the part or product can be identified The sequence of operations to be programmed can be identified The reasons for selecting the chosen tool path(s) and sequence of operations can be explained The zero point of the wire cut machine can be identified

Criteria 7.22A.1.2

Tool path programmed using advanced operations, canned cycles and sub-routines or other appropriate sub-routines within system

Assessor guide: observe that –

Assessor guide: confirm that –

The canned cycles and sub-routines accessible in the particular NC/CNC machine can be identified The application of each canned cycle and sub-routine available can be given Where appropriate, the canned cycles and/or sub-routines to be used in the NC/CNC program can be identified The reasons for selecting the chosen canned cycles and/or sub-routines can be explained

Criteria 7.22A.1.3

Program written in standard code format, confirmed and edited as necessary using appropriate routine and standard operating procedures

Assessor guide: observe that –

Assessor guide: confirm that –

An appropriate NC/CNC program is written in standard code format and incorporates, where appropriate, canned cycles and sub-routines The standard codes used in the writing of NC/CNC programs can be identified The applications of standard codes in NC/CNC programming can be explained The procedures for writing NC/CNC programs in standard code format can be given

Criteria 7.22A.1.4

Program stored in accordance with standard operating procedures

Assessor guide: observe that –

The program is stored in accordance with standard operating procedures

Assessor guide: confirm that –

The procedures for storing NC/CNC programs can be identified

Criteria 7.22A.1.5

Operation sheet produced to standard operating procedure

Assessor guide: observe that –

All relevant information is included in the NC/CNC operation sheet(s) The NC/CNC operation sheet(s) are produced in accordance with specifications and standard operating procedures

Assessor guide: confirm that –

The procedures for completing NC/CNC operation sheets can be given The information to be included in NC/CNC operation sheets can be identified

Element 7.22A.2 Trial program**Criteria 7.22A.2.1**

Program downloaded, machining parameters that may include wire offset, wire speed, power settings are selected

Assessor guide: observe that –

The NC/CNC program is downloaded in accordance with standard operating procedures The downloaded NC/CNC program is verified in accordance with standard operating procedures The appropriate machining parameters are entered into the machine controller in accordance with standard operating procedures

Assessor guide: confirm that –

The NC/CNC program appropriate to the given task(s) is identified The procedures for downloading NC/CNC programs can be identified The procedures for verifying downloaded NC/CNC programs can be identified The machining parameters that may be entered into the machine controller can be identified The effect of varying the machining parameters on the product or part produced can be explained

Criteria 7.22A.2.2

Machine prepared, work piece loaded, aligned, datum and reference points established in accordance with standard operating procedures

Assessor guide: observe that –

Appropriate work holding fixtures/ devices/tools are located and mounted onto the machine as required in accordance with specifications and standard operating procedures All safety features and equipment are checked for correct operation in accordance with standard operating procedures All datum and reference points are established in accordance with standard operating procedures

Assessor guide: confirm that –

The appropriate work holding fixtures/devices/tools can be identified The procedures for mounting work holding fixtures/devices tools can be given The location of the required work holding fixtures/devices/tools relative to the machine datum or zero can be correctly identified The purpose of datum setting can be explained The pre-start checks to be undertaken can be identified The safety features and equipment of the NC/CNC machine can be identified The purpose and function of the safety features and/or equipment can be explained

Criteria 7.22A.2.3

Machine operated in appropriate mode to test and prove program, work piece positioning

Assessor guide: observe that –

The NC/CNC program is tested and proven in accordance with standard operating procedures The position of the work piece is tested for conformance to specification in accordance with standard operating procedures

Assessor guide: confirm that –

The machine mode appropriate to the testing and proving of the NC/CNC program and the checking of the position of the work piece can be identified The procedures to be followed when using the machine in this mode can be identified The relative position of the work piece to the machine datum or zero can be identified

Criteria 7.22A.2.4

Finished components are checked for conformance with drawing specifications

Assessor guide: observe that –

The parts or products produced are checked for conformance with specifications in accordance with standard operating procedures

Assessor guide: confirm that –

The specifications of the part or product can be identified The measuring equipment/techniques to be used to check for conformance to specification can be identified

Range statement

This unit extends to programming a range of CNC wire cut machines. Programming includes 2 axis tool paths, 4 axis conical cutting, auto multi-cavity work pieces. Technical difficulties are resolved in consultation with appropriate technical advisers. Work is carried out autonomously using predetermined standards of quality and safety.

Evidence guide**Assessment context**

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the programming of CNC wire cut machines or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 7.23B B Program and set up CNC manufacturing cell

Band – Specialisation band B

Field – Machine & process operations

Unit Weight 6

This unit covers the competencies required to program operations, set up the cell and test the operation of the cell. The unit extends to CNC machines and associated integrated equipment/robots used in flexible manufacturing cell. It may include the use of multi-spindle machines, 4 and 5 axis machines and pallet loaded machining centres.

Note - This unit can be regarded as a Specialisation band A unit from C11 onwards.

Pre-requisite units - Path 2

2.5C11 Measure with graduated devices
7.7A Perform milling operations
7.18A Basic NC/CNC programming

7.5A Perform general machining
7.15A Set NC/CNC machines/process (basic)
7.19A Program NC/CNC machining centre

7.6A Perform lathe operations
7.16A Set and edit NC/CNC machine/process
7.20A Program multiple spindle and/or multiple axis
NC/CNC machining centre

9.2A Interpret technical drawing

18.1A Use hand tools

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices
7.18A Basic NC/CNC programming

7.15A Set NC/CNC machines/process (basic)
7.19A Program NC/CNC machining centre

7.16A Set and edit NC/CNC machine/process
7.20A Program multiple spindle and/or multiple axis
NC/CNC machining centre

7.24A Operate and monitor machine/process
18.1A Use hand tools

7.28A Operate NC/CNC machine/process (basic)

9.2A Interpret technical drawing

Pre-requisite units - Path 3

2.5C11 Measure with graduated devices

5.7A Manual heating and thermal cutting

5.8A Advanced manual thermal cutting, gouging and
shaping

5.9A Automated thermal cutting
7.18A Basic NC/CNC programming

7.15A Set NC/CNC machines/process (basic)
7.19A Program NC/CNC machining centre

7.16A Set and edit NC/CNC machine/process
7.20A Program multiple spindle and/or multiple axis
NC/CNC machining centre

9.2A Interpret technical drawing

18.1A Use hand tools

Element 7.23B.1 Program operations

Criteria 7.23B.1.1

Engineering drawings and manufacturing specifications are interpreted and understood to determine equipment required

Assessor guide: observe that –

All relevant drawings, specifications and instructions are obtained in accordance with workplace procedures

Assessor guide: confirm that –

The operations to be performed in producing the given part or product can be identified The appropriate type(s) of NC/CNC machine to perform the required machining operations can be identified The appropriate means of part or product transfer between machines can be identified The reasons for selecting the chosen equipment and machinery can be explained

Criteria 7.23B.1.2

Programs equipment/cell schedule

Assessor guide: observe that –

The appropriate NC/CNC programs are loaded/downloaded into the individual machine controllers in accordance with standard operating procedures Where appropriate, NC/CNC programs are written to ensure that the components of the cell operate in the correct sequence

Assessor guide: confirm that –

The NC/CNC programs for use in each of the cell components can be identified The sequence of machining and transfer operations can be identified The means of coordinating the operations of all components within the cell can be explained The communication requirements between components of the cell can be identified

Criteria 7.23B.1.3

Links controllers for integration

Assessor guide: observe that –

The machine controllers of NC/ CNC machines and transfer devices are correctly linked in accordance with standard operating procedures

Assessor guide: confirm that –

The methods of linking machine controllers can be identified The precautions to be taken when linking machine controllers can be explained The procedures for linking machine controllers can be given

Element 7.23B.2 Set up cell**Criteria 7.23B.2.1**

Configures manufacturing cell machines and equipment to meet production specifications

Assessor guide: observe that –

The machines and equipment are appropriately located in accordance with standard operating procedures to ensure that manufacturing cell performance is optimised

Assessor guide: confirm that –

The specifications of the part or product to be produced can be identified The optimum physical relationship between the machines and equipment within the cell can be identified The reasons for selecting this configuration of machines and equipment can be explained

Criteria 7.23B.2.2

Installs and adjusts tooling and work holding devices to meet specifications

Assessor guide: observe that –

All tooling and work holding devices are installed and adjusted, where appropriate, in accordance with standard operating procedures

Assessor guide: confirm that –

The appropriate tooling for each component of the cell can be identified The reasons for tooling selection can be given The appropriate work holding devices for each component of the cell can be identified The reasons for selecting the chosen work holding devices can be given The effects of adjustments to tooling and/or work holding devices on the part or product specifications can be explained

Element 7.23B.3 Test cell operation**Criteria 7.23B.3.1**

Operates and adjusts cell to produce components to specification

Assessor guide: observe that –

The manufacturing cell is operated in accordance with standard operating procedures The part or product is checked for conformance with specifications in accordance with standard operating procedures Where appropriate the operation of the cell is adjusted in accordance with standard operating procedures to ensure the parts or products produced conform to specification The performance of the manufacturing cell is optimised

Assessor guide: confirm that –

The operating procedures for the manufacturing cell can be identified, or where appropriate, prepared The measurements to be taken to check the part or product for conformance to specification can be identified The techniques/equipment to be used to measure the part or product can be identified The effect of adjustments on cell performance can be explained The causes of non-essential dwell times can be explained Where appropriate, the action to be taken to minimise dwell times can be identified

Range statement

Extends to Computer Numerical Control machines and associated integrated equipment/robots used in a flexible manufacturing cell and other advanced operations. This may include the use of multi-spindle machines, 4 and 5 axis machines and pallet loaded machining centres. Work is performed to predetermined standards, specifications and quality. Work is carried out autonomously using predetermined standards of quality and safety. Where machining skills in excess of Unit 7.5A (Perform general machining) are required, then appropriate units should also be selected. Unit 12.3A (Precision mechanical measurement) should also be accessed when precision measurement skills are required.

Evidence guide**Assessment context**

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the programming and set up of CNC manufacturing cells or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 7.24A A Operate and monitor machine/process

Band – Specialisation band A

Field – Machine & process operations

Unit Weight 4

Element 7.24A.1 Obtain job instructions

Criteria 7.24A.1.1

Job sheets or equivalent instructions interpreted correctly.

Assessor guide: observe that –

All relevant documentation is obtained in accordance with work place procedures.

Assessor guide: confirm that –

The job requirements can be identified.

Element 7.24A.2 Conduct pre-start checks

Criteria 7.24A.2.1

Pre-start checks undertaken to standard operating procedure.

Assessor guide: observe that –

Pre-start checks are undertaken in accordance with standard operating procedures.

Assessor guide: confirm that –

The pre-start checks to be undertaken can be identified.

Criteria 7.24A.2.2

Correct safety procedures are observed and all safety equipment checked for correct operation.

Assessor guide: observe that –

All safety equipment and guards are checked for correct operation in accordance with standard operating procedures. The correct safety procedures are followed at all times

Assessor guide: confirm that –

The safety features of the machine/process being operated can be identified. The safety equipment associated with the machine/process can be identified. The safety procedures associated with the machine/process can be identified.

Element 7.24A.3 Operate machine/process

Criteria 7.24A.3.1

Machine/process started up safely and correctly in accordance with standard operating procedures.

Assessor guide: observe that –

The machine/process is started up safely in accordance with standard operating procedures.

Assessor guide: confirm that –

The machine/process start up procedures can be identified.

Criteria 7.24A.3.2

Machine/process is operated in accordance with job instructions or standard operating procedures.

Assessor guide: observe that –

The machine/process is operated in accordance with job requirements and standard operating procedures.

Assessor guide: confirm that –

The machine/process operating procedures can be identified.

Criteria 7.24A.3.3

Components/feed stock is loaded and maintained consistent with production requirements.

Assessor guide: observe that –

Components/feed stock are loaded in accordance with production requirements and standard operating procedures.

Assessor guide: confirm that –

The component/feed stock levels to achieve production requirements can be identified.

Criteria 7.24A.3.4

Machine/process output is unloaded safely to standard operating procedure as required.

Assessor guide: observe that –

Where appropriate the machine/process output is unloaded safely in accordance with standard operating procedures.

Assessor guide: confirm that –

Where appropriate the machine/process unloading procedures can be identified.

Criteria 7.24A.3.5

Machine/process output handled and stored in a manner not likely to cause damage as required.

Assessor guide: observe that –

Where appropriate machine/process output is handled and stored in accordance with standard operating procedures. Machine/process output is not damaged during handling or storage.

Assessor guide: confirm that –

The procedure for handling and storing finished work can be identified. The consequences of improper handling and storage of finished work can be given.

Criteria 7.24A.3.6

Production data recorded to standard operating procedure.

Assessor guide: observe that –

All production records are completed in accordance with standard operating procedures.

Assessor guide: confirm that –

The production recording requirements can be identified.

Element 7.24A.4 Monitor machine/process**Criteria 7.24A.4.1**

Machine/process monitored for safe and correct operation, deviations and faults are identified and reported in accordance with standard operating procedures.

Assessor guide: observe that –

The operation of the machine/process is monitored in accordance with standard operating procedures. Product faults/deviations can be identified. Where appropriate, product faults/ deviations detected are reported in accordance with standard operating procedures.

Assessor guide: confirm that –

The correct operation of the machine/process can be identified. Examples of product faults and deviations can be given. Where appropriate, the person(s) to whom faults/deviations are to be reported can be identified.

Criteria 7.24A.4.2

Emergency procedures are understood and followed in accordance with standard operating procedures.

Assessor guide: observe that –

Where appropriate, the individual correctly follows emergency procedures during drills and/or exercises.

Assessor guide: confirm that –

The emergency procedures associated with the machine/process operated and monitored can be identified. The procedures to be followed in given situations can be identified.

Range statement

This unit applies to a range of production operations or continuous processes e.g. pressing, punching, plastic moulding, extruding, bending, joining, rolling, forming, drawing, metal removal, pickling, cylinder filling, printing, painting etc. The work is performed in accordance with clear step by step instructions and procedures documented on job sheets or similar process instruction documents, operational adjustments to the machine or process by the operator are made using external controls. Where production packaging and labelling of the finished goods or product is required Unit 11.6A (Production packaging) should also be considered. Basic operation (excluding setting and tool adjustments) of CNC machines is covered by this unit. This unit should not be selected with any of the following units unless the skills of this unit are being applied to an additional and different type of machine and or process. Unit 4.1A (Operate furnaces), Unit 4.2A (Gravity die casting), Unit 4.3A (Operate pressure die casting machine), Unit 4.6A (Operate sand moulding/core moulding machines), Unit 6.1A (Hand forging), Unit 6.2A (Hammer forging), Unit 8.1A (Wire, jig and barrel load/unload work), Unit 8.8A (Operate and control surface finishing waste treatment process), Unit 8.4A (Finish work using wet, dry and vapour deposition methods).

Evidence guide

Assessment context

This unit should be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the operation and monitoring of a machine/process or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 7.25A A Advanced machine/process operation

Band – Specialisation band A

Field – Machine & process operations

Unit Weight 6

Pre-requisite units - Path 1

7.1A Operational maintenance of machines/equipment
18.1A Use hand tools

7.24A Operate and monitor machine/process

9.1A Draw and interpret sketch

Pre-requisite units - Path 2

7.1A Operational maintenance of machines/equipment
18.1A Use hand tools

7.24A Operate and monitor machine/process

9.2A Interpret technical drawing

Element 7.25A.1 Determine job requirements

Criteria 7.25A.1.1

Drawings, job instructions and specifications are interpreted and task requirements understood including machine/process selection and settings.

Assessor guide: observe that –

All relevant documentation is obtained in accordance with work site procedures.

Assessor guide: confirm that –

The job requirements can be identified.

Element 7.25A.2 Observe safety precautions

Criteria 7.25A.2.1

Check safety equipment and guards for correct position and operation.

Assessor guide: observe that –

All safety equipment and guards are checked for correct position in accordance with work site procedures. All safety equipment and guards are checked for correct operation in accordance with work site procedures.

Assessor guide: confirm that –

The safety features of the machine/process being operated can be identified. The safety equipment associated with the machine/process can be identified.

Element 7.25A.3 Conduct pre-start checks**Criteria 7.25A.3.1**

Programmed operational maintenance undertaken to standard operating procedure.

Assessor guide: observe that –

Programmed maintenance schedules are obtained in accordance with work site procedures. The programmed operational maintenance is undertaken in accordance with work site procedures and schedules.

Assessor guide: confirm that –

The programmed operational maintenance requirements of the machine/process can be identified.

Criteria 7.25A.3.2

Pre-start checks undertaken to standard operating procedure.

Assessor guide: observe that –

Pre-start checks are undertaken in accordance with work site procedures.

Assessor guide: confirm that –

Pre-start checks to be undertaken can be identified.

Criteria 7.25A.3.3

Verify equipment, raw material and tooling, match task requirement.

Assessor guide: observe that –

Equipment, raw materials and tooling are checked against job requirements.

Assessor guide: confirm that –

The equipment, raw material and tooling required to meet the product specifications can be identified.

Element 7.25A.4 Operate machine/process**Criteria 7.25A.4.1**

Machine/process started up safely and correctly.

Assessor guide: observe that –

The machine/process is started up safely in accordance with work site procedures.

Assessor guide: confirm that –

The machine/process start up procedures can be identified.

Criteria 7.25A.4.2

Machine/process is operated in accordance with job instructions or standard operating procedures.

Assessor guide: observe that –

The machine/process is operated in accordance with job requirements and work site procedures.

Assessor guide: confirm that –

The machine/process operating procedures can be identified.

Criteria 7.25A.4.3

Components/feed stock is loaded and maintained consistent with production requirements.

Assessor guide: observe that –

Components/feed stock are loaded in accordance with production requirements and work site procedures.

Assessor guide: confirm that –

The component/feed stock levels to achieve production requirements can be identified.

Criteria 7.25A.4.4

Machine/process output is unloaded safely to standard operating procedure as required.

Assessor guide: observe that –

Where appropriate the machine/process output is unloaded safely in accordance with work site procedures.

Assessor guide: confirm that –

Where appropriate the machine/process unloading procedures can be identified.

Criteria 7.25A.4.5

Machine/process output handled and stored in a manner not likely to cause damage as required.

Assessor guide: observe that –

Where appropriate machine/process output is handled and stored in accordance with work site procedures.
Machine/process output is not damaged during handling or storage.

Assessor guide: confirm that –

The procedure for handling and storing finished work can be identified. The consequences of improper handling and storing of finished work can be given.

Criteria 7.25A.4.6

Production data recorded to standard operating procedure.

Assessor guide: observe that –

All production records are completed in accordance with work site procedures.

Assessor guide: confirm that –

The production recording requirements can be identified.

Element 7.25A.5 Monitor machine/process**Criteria 7.25A.5.1**

Machine/process monitored for safe and correct operation.

Assessor guide: observe that –

The operation of the machine/process is monitored in accordance with work site procedures.

Assessor guide: confirm that –

The correct operation of the machine/process can be identified.

Criteria 7.25A.5.2

Emergency procedures are understood and followed in accordance with standard operating procedures.

Assessor guide: observe that –

Assessor guide: confirm that –

The emergency procedures associated with the machine/process operated and monitored can be identified. The procedures to be followed in given situations can be identified.

Element 7.25A.6 Recognise and rectify deviations and faults in product/output**Criteria 7.25A.6.1**

Product faults/deviations are recognised from standard operating procedures, job sheets or other documentation.

Assessor guide: observe that –

Assessor guide: confirm that –

Examples of types of product fault/deviations can be given.

Criteria 7.25A.6.2

Product faults/deviations are rectified in accordance with standard operating procedures, job sheets or other documentation and may be achieved by adjustment of machine/process settings within parameters.

Assessor guide: observe that –

Product faults/deviations are identified. Appropriate corrective action/adjustment is undertaken to return the product to specification in accordance with work site procedures.

Assessor guide: confirm that –

The corrective action to be undertaken to rectify types of product fault/deviations can be identified.

Element 7.25A.7 Recognise and rectify deviations and faults with raw material/feed stock**Criteria 7.25A.7.1**

Raw material faults/deviations are recognised from standard operating procedures, job sheets or other documentation.

Assessor guide: observe that –

Assessor guide: confirm that –

Examples of raw material faults/deviations can be given.

Criteria 7.25A.7.2

Raw material faults/deviations are rectified in accordance with standard operating procedures, job sheets or other documentation.

Assessor guide: observe that –

Raw material faults/deviations are identified. Appropriate corrective action is undertaken to ensure that raw material/feed stock conforms to specification in accordance with work site procedures.

Assessor guide: confirm that –

The correct action to be undertaken to rectify types of raw material faults/deviations can be identified.

Element 7.25A.8 Recognise and rectify deviations and faults in process equipment**Criteria 7.25A.8.1**

Process equipment faults/deviations are identified against specifications and reported to standard operating procedure.

Assessor guide: observe that –

Assessor guide: confirm that –

Examples of process equipment faults/deviations can be given. Appropriate reporting procedures can be identified.

Criteria 7.25A.8.2

Process equipment faults/deviations are rectified in accordance with standard operating procedures, job sheets or other documentation.

Assessor guide: observe that –

Process equipment faults/deviations are identified. Appropriate corrective action is undertaken to ensure that process equipment conforms to specification in accordance with work site procedures.

Assessor guide: confirm that –

The correct action to be undertaken to rectify types of process equipment faults/deviations can be identified.

Element 7.25A.9 Recognise and rectify deviations and faults in machine/process**Criteria 7.25A.9.1**

Machine/process faults/deviations are recognised from standard operating procedures, job sheets or other documentation.

Assessor guide: observe that –

Assessor guide: confirm that –

Examples of deviations and faults in machine/process can be given.

Criteria 7.25A.9.2

Machine/process faults/deviations are rectified in accordance with standard operating procedures, job sheets or other documentation.

Assessor guide: observe that –

Machine/process faults/deviations are identified. Appropriate corrective action is undertaken to ensure that the machine/process conforms to specification in accordance with work site procedures.

Assessor guide: confirm that –

The correct action to be undertaken to rectify types of machine/process faults/deviations can be identified.

Range statement

This unit relates to operations where the output of the machine/process can be varied at the discretion of the operator and where recognition/rectification skills are applied based upon product/material/process knowledge to achieve specified outcomes. Deviations and faults of the machine, raw material, process equipment and process are recognised and rectified in accordance with standard operating procedures in order to meet the specification. Work is performed autonomously or in teams. Where interpretation of a technical drawing to Australian Standard 1100/1102 or equivalent is required, Unit 9.2A (Interpret technical drawing) should also be selected. When production packaging and labelling of the finished goods or product is required then Unit 11.6A (Production packaging) should also be considered.

Evidence guide

Assessment context

This unit should be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with units addressing the safety, quality, communication, materials handling recording and reporting associated with the competent operation, monitoring and fault rectification of production machines and processes, or other competencies requiring the exercise of the skills and knowledge covered by this unit. Competence in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures and maintenance schedules. - Any relevant product and manufacturing specifications. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment, the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities.

Unit MEM 7.26A A Advanced plastic processing

Band – Specialisation band A

Field – Machine & process operations

Unit Weight 6

Pre-requisite units - Path 1

7.1A Operational maintenance of machines/equipment
18.1A Use hand tools

7.24A Operate and monitor machine/process

9.1A Draw and interpret sketch

Pre-requisite units - Path 2

7.1A Operational maintenance of machines/equipment
18.1A Use hand tools

7.24A Operate and monitor machine/process

9.2A Interpret technical drawing

Element 7.26A.1 Determine job requirements

Criteria 7.26A.1.1

Drawings, job instructions and specifications are interpreted and task requirements understood including machine/process selection and settings.

Assessor guide: observe that –

All relevant documentation is obtained in accordance with work site procedures.

Assessor guide: confirm that –

The job requirements can be identified.

Element 7.26A.2 Observe safety precautions

Criteria 7.26A.2.1

Check safety equipment and guards for correct position and operation.

Assessor guide: observe that –

All safety equipment and guards are checked for correct position in accordance with work site procedures. All safety equipment and guards are checked for correct operation in accordance with work site procedures.

Assessor guide: confirm that –

The safety features of the machine/process being operated can be identified. The safety equipment associated with the machine/process can be identified.

Element 7.26A.3 Conduct pre-start checks**Criteria 7.26A.3.1**

Programmed operational maintenance undertaken to standard operating standard procedure.

Assessor guide: observe that –

Programmed maintenance schedules are obtained in accordance with work site procedures. The programmed operational maintenance is undertaken in accordance with work site procedures and schedules.

Assessor guide: confirm that –

The programmed operational maintenance requirements of the machine/process can be identified.

Criteria 7.26A.3.2

Pre-start checks undertaken to standard operating procedure.

Assessor guide: observe that –

Pre-start checks are undertaken in accordance with work site procedures.

Assessor guide: confirm that –

Pre-start checks to be undertaken can be identified.

Criteria 7.26A.3.3

Verify equipment, raw material and tooling match task requirement.

Assessor guide: observe that –

Equipment, raw material and tooling are checked against job requirements.

Assessor guide: confirm that –

The equipment, raw material and tooling required to meet the product specifications can be identified.

Element 7.26A.4 Operate machine/process**Criteria 7.26A.4.1**

Machine/process started up safely and correctly.

Assessor guide: observe that –

The machine/process is started up safely in accordance with work site procedures.

Assessor guide: confirm that –

The machine/process start-up procedures can be identified.

Criteria 7.26A.4.2

Machine/process is operated in accordance with job instructions or standard operating procedures.

Assessor guide: observe that –

The machine/process is operated in accordance with job requirements and work site procedures.

Assessor guide: confirm that –

The machine/process operating procedures can be identified.

Criteria 7.26A.4.3

Components/feed stock are loaded and maintained consistent with production requirements.

Assessor guide: observe that –

Components/feed stock are loaded in accordance with production requirements and work site procedures.

Assessor guide: confirm that –

The component/feed stock levels to achieve production requirements can be identified.

Criteria 7.26A.4.4

Machine/process output is unloaded safely to standard operating procedure.

Assessor guide: observe that –

Where appropriate, the machine/ process output is unloaded safely in accordance with work site procedures.

Assessor guide: confirm that –

Where appropriate, the machine/ process unloading procedures can be identified.

Criteria 7.26A.4.5

Machine/process output handled and stored in a manner not likely to cause damage as required.

Assessor guide: observe that –

Where appropriate, machine/process output is handled and stored in accordance with work site procedures. Machine/process output is not damaged during handling or storage.

Assessor guide: confirm that –

The procedure for handling and storing finished work can be identified. The consequences of improper handling and storing of finished work can be given.

Criteria 7.26A.4.6

Production data recorded to standard operating procedure.

Assessor guide: observe that –

All production records are completed in accordance with work site procedures.

Assessor guide: confirm that –

The production recording requirements can be identified.

Element 7.26A.5 Monitor machine/process**Criteria 7.26A.5.1**

Machine/process monitored for safe and correct operation.

Assessor guide: observe that –

The operation of the machine/process is monitored according to work site procedures.

Assessor guide: confirm that –

The correct operation of the machine/process can be identified.

Criteria 7.26A.5.2

Emergency procedures are understood and followed in accordance with standard operating procedures.

Assessor guide: observe that –

Assessor guide: confirm that –

The emergency procedures associated with the machine/process operated and monitored can be identified. The procedures to be followed in given situations can be identified.

Element 7.26A.6 Recognise and rectify deviations and faults in product/output**Criteria 7.26A.6.1**

Product faults/deviations such as short shots, warped mouldings, dimensional errors are recognised from standard operating procedures, job sheets or other documentation.

Assessor guide: observe that –

Assessor guide: confirm that –

Examples of product fault/deviations can be given.

Criteria 7.26A.6.2

Product faults/deviations are rectified in accordance with standard operating procedures, job sheets or other documentation and may be achieved by adjustment of machine/process settings within parameters.

Assessor guide: observe that –

Product faults/deviations are identified. Appropriate corrective action/ adjustment is undertaken to return the product to specification in accordance with work site procedures.

Assessor guide: confirm that –

The corrective action to be undertaken to rectify types of product fault/deviations can be identified.

Element 7.26A.7 Recognise and rectify deviations and faults with raw material/feed stock**Criteria 7.26A.7.1**

Raw material faults/deviations such as contamination, colour variation are recognised from standard operating procedures, job sheets or other documentation.

Assessor guide: observe that –

Assessor guide: confirm that –

Examples of raw material faults/ deviations can be given.

Criteria 7.26A.7.2

Raw material faults/deviations are rectified in accordance with standard operating procedures, job sheets or other documentation.

Assessor guide: observe that –

Raw material faults/deviations are identified. Appropriate corrective action is undertaken to ensure that raw material/feed stock conforms to specification in accordance with work site procedures.

Assessor guide: confirm that –

The correct action to be undertaken to rectify types of raw material faults/deviations can be identified.

Element 7.26A.8 Recognise and rectify deviations and faults in tooling**Criteria 7.26A.8.1**

Tooling faults/deviations resulting in blemishes, missing detail etc. are identified against specification and reported to standard operating procedure.

Assessor guide: observe that –

Tooling faults/deviations are identified.

Assessor guide: confirm that –

Examples of tooling faults/ deviations can be given.
Appropriate reporting procedures can be identified.

Criteria 7.26A.8.2

Tooling faults/deviations are rectified in accordance with standard operating procedures, job sheets or other documentation.

Assessor guide: observe that –

Appropriate corrective action is undertaken to ensure that tooling conforms to specification in accordance with work site procedures.

Assessor guide: confirm that –

The correct action to be undertaken to rectify types of tooling faults/ deviations can be identified.

Element 7.26A.9 Recognise and rectify deviations and faults in machine/process**Criteria 7.26A.9.1**

Machine/process faults/deviations such as short shots, burn marks, distortion etc. are recognised from standard operating procedures, job sheets or other documentation.

Assessor guide: observe that –

Machine/process faults/deviations are identified.

Assessor guide: confirm that –

Examples of deviations and faults in machine/process can be given.

Criteria 7.26A.9.2

Machine/process faults/deviations are rectified in accordance with standard operating procedures, job sheets or other documentation.

Assessor guide: observe that –

Appropriate corrective action is undertaken to ensure that the machine/process conforms to specification in accordance with work site procedures.

Assessor guide: confirm that –

The correct action to be undertaken to rectify types of machine/process faults/deviations can be identified.

Range statement

This unit applies to a range of plastic, rubber processing including injection, blow moulding, processing of fibre reinforced composites, extrusion, thermoforming, vacuum forming, foaming etc. This unit relates to operations where the output of the machine/process can be varied at the discretion of the operator and where recognition/rectification skills are applied based upon product/material/process knowledge to achieve specified outcomes. Deviations and faults of the machine, raw material, tooling and process are recognised and rectified in accordance with standard operating procedures in order to meet the specification. Work is performed autonomously or in teams. Where interpretation of a technical drawing to Australian Standard 1100/1102 or equivalent is required, Unit 9.2A (Interpret technical drawing) should also be selected. When production packaging and labelling of the finished goods or product is required then Unit 11.6A (Production packaging) should also be considered.

Evidence guide

Assessment context

This unit should be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with advanced plastic processing or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 7.27A A Advanced press operations

Band – Specialisation band A

Field – Machine & process operations

Unit Weight 6

Pre-requisite units - Path 1

7.1A Operational maintenance of machines/equipment
18.1A Use hand tools

7.24A Operate and monitor machine/process

9.1A Draw and interpret sketch

Pre-requisite units - Path 2

7.1A Operational maintenance of machines/equipment
18.1A Use hand tools

7.24A Operate and monitor machine/process

9.2A Interpret technical drawing

Element 7.27A.1 Determine job requirements

Criteria 7.27A.1.1

Drawings, job instructions and specifications are interpreted and task requirements understood including machine/process selection and settings.

Assessor guide: observe that –

All relevant documentation is obtained in accordance with work site procedures.

Assessor guide: confirm that –

The job requirements can be identified.

Element 7.27A.2 Observe safety precautions

Criteria 7.27A.2.1

Check safety equipment and guards for correct position and operation.

Assessor guide: observe that –

All safety equipment and guards are checked for correct position in accordance with work site procedures. All safety equipment and guards are checked for correct operation in accordance with work site procedures.

Assessor guide: confirm that –

The safety features of the machine/process being operated can be identified. The safety equipment associated with the machine/process can be identified.

Element 7.27A.3 Conduct pre-start checks**Criteria 7.27A.3.1**

Programmed operational maintenance undertaken to standard operating procedure.

Assessor guide: observe that –

Programmed maintenance schedules are obtained in accordance with work site procedures. The programmed operational maintenance is undertaken in accordance with work site procedures and schedules.

Assessor guide: confirm that –

The programmed operational maintenance requirements of the machine/process can be identified.

Criteria 7.27A.3.2

Pre-start checks undertaken to standard operating procedure.

Assessor guide: observe that –

Pre-start checks are undertaken in accordance with work site procedures.

Assessor guide: confirm that –

Pre-start checks to be undertaken can be identified.

Criteria 7.27A.3.3

Verify equipment, raw material and tooling match task requirement.

Assessor guide: observe that –

Equipment, raw material and tooling are checked against job requirements.

Assessor guide: confirm that –

The equipment, raw material and tooling required to meet the product specifications can be identified.

Element 7.27A.4 Operate machine/process**Criteria 7.27A.4.1**

Machine/process started up safely and correctly.

Assessor guide: observe that –

The machine/process is started up safely in accordance with work site procedures.

Assessor guide: confirm that –

The machine/process start-up procedures can be identified.

Criteria 7.27A.4.2

Machine/process is operated in accordance with job instructions or standard operating procedures.

Assessor guide: observe that –

The machine/process is operated in accordance with job requirements and work site procedures.

Assessor guide: confirm that –

The machine/process operating procedures can be identified.

Criteria 7.27A.4.3

Components/feed stock is loaded and maintained consistent with production requirements.

Assessor guide: observe that –

Components/feed stock are loaded in accordance with production requirements and work site procedures.

Assessor guide: confirm that –

The component/feed stock levels to achieve production requirements can be identified.

Criteria 7.27A.4.4

Machine/process output is unloaded safely to standard operating procedure as required.

Assessor guide: observe that –

Where appropriate, the machine/ process output is unloaded safely in accordance with work site procedures.

Assessor guide: confirm that –

Where appropriate, the machine/ process unloading procedures can be identified.

Criteria 7.27A.4.5

Machine/process output handled and stored in a manner not likely to cause damage as required.

Assessor guide: observe that –

Where appropriate, machine/process output is handled and stored in accordance with work site procedures. Machine/process output is not damaged during handling or storage.

Assessor guide: confirm that –

The procedure for handling and storing finished work can be identified. The consequences of improper handling and storing of finished work can be given.

Criteria 7.27A.4.6

Production data recorded to standard operating procedure.

Assessor guide: observe that –

All production records are completed in accordance with work site procedures.

Assessor guide: confirm that –

The production recording requirements can be identified.

Element 7.27A.5 Monitor machine/process**Criteria 7.27A.5.1**

Machine/process monitored for safe and correct operation.

Assessor guide: observe that –

The operation of the machine/process is monitored according to work site procedures.

Assessor guide: confirm that –

The correct operation of the machine/process can be identified.

Criteria 7.27A.5.2

Emergency procedures are understood and followed in accordance with standard operating procedures.

Assessor guide: observe that –

Assessor guide: confirm that –

The emergency procedures associated with the machine/process operated and monitored can be identified. The procedures to be followed in given situations can be identified.

Element 7.27A.6 Recognise and rectify deviations and faults in product/output**Criteria 7.27A.6.1**

Product faults/deviations such as splits, warping, deformation, dimensional errors etc. are recognised from standard operating procedures, job sheets or other documentation.

Assessor guide: observe that –

Assessor guide: confirm that –

Examples of product fault/deviations can be given.

Criteria 7.27A.6.2

Product faults/deviations are rectified in accordance with standard operating procedures, job sheets or other documentation and may be achieved by adjustment of machine/process settings within parameters.

Assessor guide: observe that –

Product faults/deviations are identified. Appropriate corrective action/ adjustment is undertaken to return the product to specification in accordance with work site procedures.

Assessor guide: confirm that –

The corrective action to be undertaken to rectify types of product fault/deviations can be identified.

Element 7.27A.7 Recognise and rectify deviations and faults with raw material/feed stock**Criteria 7.27A.7.1**

Raw material faults/deviations such as gauge variation, hardness, colour variation etc. are recognised from standard operating procedures, job sheets or other documentation.

Assessor guide: observe that –

Assessor guide: confirm that –

Examples of raw material faults/ deviations can be given.

Criteria 7.27A.7.2

Raw material faults/deviations are rectified in accordance with standard operating procedures, job sheets or other documentation.

Assessor guide: observe that –

Raw material faults/deviations are identified. Appropriate corrective action is undertaken to ensure that raw material/feed stock conforms to specification in accordance with work site procedures.

Assessor guide: confirm that –

The correct action to be undertaken to rectify types of raw material faults/deviations can be identified.

Element 7.27A.8 Recognise and rectify deviations and faults in tooling**Criteria 7.27A.8.1**

Tooling faults/deviations resulting in marks, missing detail, dimensional errors etc. are identified against specifications and reported to standard operating procedure.

Assessor guide: observe that –

Assessor guide: confirm that –

Examples of tooling faults/ deviations can be given.
Appropriate reporting procedures can be identified.

Criteria 7.27A.8.2

Tooling faults/deviations are rectified in accordance with standard operating procedures, job sheets or other documentation.

Assessor guide: observe that –

Tooling faults/deviations are identified. Appropriate corrective action is undertaken to ensure that tooling conforms to specification in accordance with work site procedures.

Assessor guide: confirm that –

The correct action to be undertaken to rectify types of tooling faults/deviations can be identified.

Element 7.27A.9 Recognise and rectify deviations and faults in machine/process**Criteria 7.27A.9.1**

Machine/process faults/deviations resulting in splits, distortion etc. are recognised from standard operating procedures, job sheets or other documentation.

Assessor guide: observe that –

Assessor guide: confirm that –

Examples of deviations and faults in machine/process can be given.

Criteria 7.27A.9.2

Machine/process faults/deviations are rectified in accordance with standard operating procedures, job sheets or other documentation.

Assessor guide: observe that –

Machine/process faults/deviations are identified. Appropriate corrective action is undertaken to ensure that the machine/process conforms to specification in accordance with work site procedures.

Assessor guide: confirm that –

The correct action to be undertaken to rectify types of machine/process faults/deviations can be identified.

Range statement

This unit applies to a range of metal working press operations including drawing, blanking, bending, coining, sizing, extruding, forming and shaping. This unit relates to operations where the output of the machine/process can be varied at the discretion of the operator and where recognition/rectification skills are applied based upon product/material/process knowledge to achieve specified outcomes. Deviations and faults of the machine, raw material, tooling and process are recognised and rectified in accordance with standard operating procedure in order to meet the specification. Work is performed autonomously or in teams. Where interpretation of a technical drawing to Australian Standard 1100/1102 or equivalent is required, Unit 9.2A (Interpret technical drawing) should also be selected. When production packaging and labelling of the finished goods or product is required then Unit 11.6A (Production packaging) should also be considered.

Evidence guide

Assessment context

This unit should be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with advanced press operation or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 7.28A A Operate NC/CNC machine/process (basic)

Band – Specialisation band A

Field – Machine & process operations

Unit Weight 2

Pre-requisite units - Path 1

7.24A Operate and monitor machine/process

Element 7.28A.1 Obtain job instructions

Criteria 7.28A.1.1

Job sheets or equivalent instructions understood and correctly followed.

Assessor guide: observe that –

All relevant documentation is obtained in accordance with work place procedures.

Assessor guide: confirm that –

The job requirements can be identified.

Element 7.28A.2 Conduct pre-start checks

Criteria 7.28A.2.1

Pre-start checks undertaken to standard operating procedure.

Assessor guide: observe that –

Pre-start checks are undertaken in accordance with standard operating procedures.

Assessor guide: confirm that –

The pre-start checks to be undertaken can be identified.

Criteria 7.28A.2.2

Correct safety procedures are observed and all safety equipment checked for correct operation.

Assessor guide: observe that –

All safety equipment and guards are checked for correct operation in accordance with standard operating procedures. The correct safety procedures are followed at all times.

Assessor guide: confirm that –

The safety features of the machine/process being operated can be identified. The safety equipment associated with the machine/process can be identified. The safety procedures associated with the machine/process can be identified.

Element 7.28A.3 Operate NC/CNC machine/process**Criteria 7.28A.3.1**

Installed NC/CNC program selected and verified in accordance with job instructions.

Assessor guide: observe that –

That the correct NC/CNC program is selected and verified in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for accessing NC/CNC programs installed in the machine controller can be identified. The procedures for verifying that the correct NC/CNC program has been selected can be identified. The NC/CNC program to be used is correctly identified. The reasons for verifying that the correct NC/CNC program has been selected can be identified.

Criteria 7.28A.3.2

NC/CNC machine operated safely to product specifications using standard operating procedures.

Assessor guide: observe that –

The NC/CNC machine is operated safely in accordance with standard operating procedures.

Assessor guide: confirm that –

The NC/CNC machine operating procedures can be identified.

Criteria 7.28A.3.3

Machine malfunctions identified and reported.

Assessor guide: observe that –

Where appropriate, machine malfunctions identified are reported in accordance with standard operating procedures.

Assessor guide: confirm that –

Examples of machine malfunctions can be given. The procedures for reporting machine malfunctions can be identified. Where appropriate, the person to whom machine malfunctions are to be reported can be identified.

Criteria 7.28A.3.4

Production samples checked for compliance to specification using standard operating procedures.

Assessor guide: observe that –

The parts or products produced are checked for conformance to specification in accordance with standard operating procedures.

Assessor guide: confirm that –

The specifications of the product or part to be produced can be identified. The checks/measurement to be made can be identified. The measuring instruments/techniques to be used to check the part or product can be identified. The frequency with which parts or products are to be checked can be identified.

Element 7.28A.4 Monitor machine/process**Criteria 7.28A.4.1**

Tool wear monitored and where appropriate, preset tools are replaced, tool offsets identified in NC/CNC program and adjusted or other corrective action taken using standard operating procedures.

Assessor guide: observe that –

The machine or process is monitored for signs of tool wear in accordance with standard operating procedures. Where appropriate, corrective action is undertaken in accordance with standard operating procedures.

Assessor guide: confirm that –

Examples of tool wear and the effect on product or part specifications can be given. The corrective procedures to be followed once tool wear has been detected can be given. Where appropriate, pre-set tools that can be replaced can be identified. Where appropriate, adjustments to tool offsets that can be made can be identified. The effect of adjustments on part or product specifications can be explained.

Criteria 7.28A.4.2

Product deviation from specification reported in accordance with standard operating procedures.

Assessor guide: observe that –

Where appropriate, part or product deviations from specification are reported in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for reporting deviations of the part or product from specification can be identified. Where appropriate, the person to whom part or product deviations are reported can be identified.

Range statement

The skills described in this unit are meant to apply to a range of NC/CNC machines/processes in a production environment. Work is performed to established processes, practices, specifications and instructions as appropriate. Technical difficulties are resolved in consultation with appropriate technical advisers. Work is carried out autonomously using predetermined standards of quality and safety. An appropriate level of measurement skill should be selected with this unit. Where it is required to use tools, then Unit 18.1A (Use hand tools) should also be selected. Where basic operation excludes setting and tool adjustment skills, then Unit 7.24A (Operate and monitor machine/process) should be selected.

Evidence guide

Assessment context

This unit should be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the operation of NC/CNC machines/processes or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 7.29A A Perform routine sharpening/maintenance of production tools and cutters

Band – Specialisation band A

Field – Machine & process operations

Unit Weight 4

Pre-requisite units - Path 1

2.4C11 Assist in the provision of on the job training
7.24A Operate and monitor machine/process

2.5C11 Measure with graduated devices
9.1A Draw and interpret sketch

7.3A Setting machines (routine)
18.1A Use hand tools

Pre-requisite units - Path 2

2.4C11 Assist in the provision of on the job training
9.2A Interpret technical drawing

2.5C11 Measure with graduated devices
18.1A Use hand tools

7.5A Perform general machining

Element 7.29A.1 Obtain job instructions

Criteria 7.29A.1.1

Job sheets or equivalent instructions interpreted correctly and understood.

Assessor guide: observe that –

All relevant drawings, instructions and specifications are obtained in accordance with workplace procedures.

Assessor guide: confirm that –

The work to be undertaken can be identified. The sequence of operations to be performed can be identified. The specifications to be achieved can be identified.

Element 7.29A.2 Observe safety precautions

Criteria 7.29A.2.1

Machine guards, coolant and dust extraction devices checked for proper operation in accordance with standard operating procedures.

Assessor guide: observe that –

All machine guards, coolant and dust extraction devices are checked for correct operation in accordance with standard operating procedures.

Assessor guide: confirm that –

All machine guards can be identified. The function of coolant and dust extraction devices can be identified.

Criteria 7.29A.2.2

Correct safety procedures observed, protective clothing and safety glasses worn.

Assessor guide: observe that –

The correct safety procedures are followed and personal protective clothing and equipment is worn/used throughout the grinding process.

Assessor guide: confirm that –

All relevant safety procedures can be identified. All necessary personal protective clothing and equipment can be identified. The hazards associated with tool and cutter grinding operations can be identified.

Element 7.29A.3 Production tooling disassembled in preparation for sharpening**Criteria 7.29A.3.1**

Production tooling is disassembled as required to facilitate sharpening in accordance with standard operating procedures.

Assessor guide: observe that –

Machine is isolated in accordance with standard operating procedures. Correct techniques used for disassembling.

Assessor guide: confirm that –

Basic process for disassembly can be explained, safety issues can be identified and described.

Element 7.29A.4 Set up machine**Criteria 7.29A.4.1**

Tool and cutter grinding wheels selected, balanced and dressed in accordance with job instructions.

Assessor guide: observe that –

Tool and cutter grinding accessories appropriate to the grinding task(s) are selected and correctly used in accordance with standard operating procedures. The grinding wheel selected is safely balanced and correctly dressed for the grinding task(s) to be performed in accordance with standard operating procedures.

Assessor guide: confirm that –

The standard grinding wheel shapes can be identified. A range of abrasive materials used in grinding wheels can be identified. The effect of the following grinding wheel features on wheel selection and application can be explained: - grain size of abrasive particles - grade or strength of bond - structure of grain spacing - bond material. The appropriate grinding wheel(s) for the given task(s) can be identified. The reasons for selecting the appropriate grinding wheel can be given. The function and application of the full range of tool and cutter grinding accessories can be explained. Grinding wheel dressing procedures can be correctly identified. Grinding wheel dressing tools and their application can be identified. The appropriate grinding wheel dressing tool(s) for the given task(s) can be identified.

Criteria 7.29A.4.2

Fixtures for locating tools/cutters to be sharpened are mounted in accordance with job instructions.

Assessor guide: observe that –

The appropriate accessories are correctly set up in accordance with standard operating procedures.

Assessor guide: confirm that –

The accessories and fixtures to be used can be identified.

Element 7.29A.5 Perform tool and cutter grinding**Criteria 7.29A.5.1**

Tools and cutters to be sharpened are mounted in predetermined fixtures.

Assessor guide: observe that –

Tools and cutters are mounted correctly in fixtures.

Assessor guide: confirm that –

Importance of correct mounting can be explained.

Criteria 7.29A.5.2

Tools and cutters are sharpened in accordance with defined procedures.

Assessor guide: observe that –

The universal tool and cutter grinder is used to correctly sharpen and shape a range of tools and cutters in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for sharpening can be identified.

Element 7.29A.6 Check tools/cutters for conformance to specification**Criteria 7.29A.6.1**

Tools/cutters visually inspected and checked, measured for conformance to specification in accordance with job instructions.

Assessor guide: observe that –

The ground components are checked for conformance with specifications in accordance with standard operating procedures.

Assessor guide: confirm that –

Tools, techniques and equipment appropriate to the checking of ground components for conformance with the following specifications can be identified: - dimensions and tolerances - geometry and tolerances - surface finish. The tools, techniques and equipment to be used to check the given ground components for conformance with specifications can be identified. The reasons for selecting the tools, techniques and equipment to be used can be explained.

Element 7.29A.7 Production tooling assembled/reassembled**Criteria 7.29A.7.1**

Production tooling is reassembled, inserts installed in accordance with job instructions.

Assessor guide: observe that –

Correct procedures are followed for re-assembly.

Assessor guide: confirm that –

Critical factors for re-assembly can be identified.

Criteria 7.29A.7.2

Assembled tooling is visually inspected and checked, measure for conformance to specification in accordance with job instructions.

Assessor guide: observe that –

The assembled, tooling is checked against specifications.

Assessor guide: confirm that –

Specifications can be obtained and interpreted.

Range statement

Work is carried out autonomously to predetermined standards of quality, safety and is performed to defined procedures using fixtures to locate tools/cutters for grinding. Production tooling may include inserted boring bars, face cutters, gear cutters etc. Equipment includes using a range of tool and cutter grinding machines and accessories. General off hand grinding/sharpening of tools etc. is covered by Unit 18.2A (Use power tools/hand held operations). For more advanced tool and cutter grinding operations, see Unit 7.10A (Perform tool and cutter grinding operations). This unit should not be selected when Unit 7.10A (Perform tool and cutter grinding operations) has already been selected.

Evidence guide**Assessment context**

This unit should be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with production/process machining or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 7.30A B Perform metal spinning lathe operations (basic)

Band – Specialisation band A

Field – Machine & process operations

Unit Weight 6

This unit covers the competencies required for the work which applies to a range of metal spinning lathes (excluding CNC), accessories, measuring equipment, and engineering standards. Sheet metals may include but are not restricted to steels, aluminium, monel, copper, brass, zinc, pewter, silver, gold, tin, etc., of varying thicknesses. Work is performed to drawings, sketches, specifications and instructions as appropriate. Spinning does not include hot spinning procedures.

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices
18.1A Use hand tools

7.32A Use workshop machines for basic operations
18.2A Use power tools/hand held operations

9.2A Interpret technical drawing

Element 7.30A.1 Observe safety precautions

Criteria 7.30A.1.1

Correct safety procedures observed and protective clothing and safety glasses worn

Assessor guide: observe that –

Appropriate coveralls and footwear are worn and in a serviceable condition. All work is carried out correctly and safely in accordance with workplace procedures

Assessor guide: confirm that –

Serviceability and appropriate of use safety wear and safe work practices are maintained at all times

Element 7.30A.2 Determine job requirements

Criteria 7.30A.2.1

Drawings are interpreted and sequence of operation determined

Assessor guide: observe that –

All drawings required are used and that the sequence of operation has been correctly adhered to in accordance with job sheet and workplace practice and procedures

Assessor guide: confirm that –

Information determined from the drawings is clearly understood and accurately applied
Each step of the sequence of operation is able to be properly explained

Criteria 7.30A.2.2

Tools are selected to produce components to specifications

Assessor guide: observe that –

The correct tools are selected throughout spinning operation
All tools selected are properly prepared for use

Assessor guide: confirm that –

The operator is able to determine that each tool has been properly prepared for use

Criteria 7.30A.2.3

Disc size is determined in accordance with appropriate procedures

Assessor guide: observe that –

The correct specifications for the job are properly selected

Assessor guide: confirm that –

The specifications are clearly understood and correctly interpreted

Criteria 7.30A.2.4

Disc is cut to the correct size and tolerance

Assessor guide: observe that –

The disc size has been properly selected and is within drawing tolerance
The correct use of the disc cutter is applied and that the finished disc is within the specified tolerance

Assessor guide: confirm that –

Element 7.30A.3 Perform spinning operations**Criteria 7.30A.3.1**

Spinning speeds are calculated for various metals and metal thicknesses using appropriate mathematical techniques and reference materials

Assessor guide: observe that –

The operator determine the appropriate speed for the material type and thickness
The lathe speed is set correctly and in accordance with operating procedures

Assessor guide: confirm that –

The operator understands why and how lathe speed is calculated

Criteria 7.30A.3.2

Correct back centre and form chucks are selected and mounted in accordance with procedures and specifications

Assessor guide: observe that –

Form chuck is selected from drawings or specifications, correctly and securely mounted by appropriate means. Back centre is selected and prepared for use in conjunction with an appropriate centre/live centre

Assessor guide: confirm that –

The operator is able to correctly determine the type of form chuck mounting required from 3 possible alternative methods

Criteria 7.30A.3.3

Prepare disc is mounted for forming

Assessor guide: observe that –

The disc is mounted and centred
The disc properly centred prior to start up to prevent departure on turning
The operator demonstrates safe working practices and ensures that they are positioned outside of the disc's travel path

Assessor guide: confirm that –

Criteria 7.30A.3.4

A full range of spinning accessories are used including: back centre, various chucks, trimming accessories, blank centre equipment and tee-rest

Assessor guide: observe that –

Accessories are appropriately utilised in accordance with operating procedures

Assessor guide: confirm that –

The function and operation of accessory is clearly understood and operated correctly in accordance with the specified procedures

Criteria 7.30A.3.5

Spinning, beading, trimming, finishing, annealing and pickling operations are performed to specifications

Assessor guide: observe that –

Operations are accurately performed using the correct tooling and accessories

Assessor guide: confirm that –

All of the processes used, are fully understood and the methods used for each process is applied safely with the correct utilisation of spinning tools

Element 7.30A.4 Check components for conformance to specifications**Criteria 7.30A.4.1**

Components are checked for conformance to specifications using appropriate techniques tools and equipment

Assessor guide: observe that –

The most appropriate method of inspection is utilised in determining conformance to specifications
All inspection tools and equipment are used in accordance with manufacturer procedures for inspection

Assessor guide: confirm that –

The operator is able to ensure all work is free from damage and defects including: tool marks, cracking, stress marks, thinning and incorrect finish etc.
The operator is able to identify the purpose and need for the use of inspection tool or equipment and is able to correctly use them as required

Element 7.30A.5 Components removed and stored**Criteria 7.30A.5.1**

Components are removed from the spinning lathe without marking or any deformation

Assessor guide: observe that –

Spinning are removed in an appropriate manner for the job at hand and are stacked in order to prevent further damage

Assessor guide: confirm that –

No damage has been incurred during removal and stacking, prior to packaging

Criteria 7.30A.5.2

Components are correctly stored and packaged as to avoid oxidation and damage

Assessor guide: observe that –

Spinning is correctly inhibited and packed in accordance with workplace procedures

Assessor guide: confirm that –

The operator is fully conversant in the workplace packing processes and understands the reasons for inhibiting and packing

Range statement

Work undertaken autonomously to predetermined specifications. Work can be carried out using hand tools or slide based tools. Work applies to a range of metal spinning lathes (excluding CNC), accessories, measuring equipment, and engineering standards. Sheet metals including but not restricted to steels, aluminium, monel, copper, brass, zinc, pewter, silver, gold, tin, etc of varying thicknesses. Work is performed to drawings, sketches, specifications and instructions as appropriate. Spinning does not include hot spinning procedures. Tool use will include either hand and/or slide tooling of varying design and materials. The correct usage of all basic metal spinning tools must be demonstrated. Where lathe maintenance to the level of dismantling and replacing components, Unit 18.55A (Dismantle, replace and assemble engineering components) should also be selected.

Evidence guide**Assessment context**

This unit should be assessed on the job.

- The competencies covered by this unit would be demonstrated by an individual working alone
- Assessment should be conducted in the individual's own work environment
- Identify colleagues who can be approached for the collection of competency evidence where appropriate
- Present evidence for credit for any off the job training related to this unit

Critical aspects

Competency in this unit cannot be claimed until pre-requisites have been satisfied

Where those pre-requisites are factored into this unit as processes etc., then if the pre-requisite is not held, it is strongly recommended that the assessment

Assessment conditions

The candidate will be provided with:

- All tools, equipment, materials and documentation required
- The candidate will be permitted to refer to the following documents
- Any relevant workplace procedures
- Any relevant product and manufacturing specifications

The candidate will be required to:

- perform 6 spinning exercises which will include 2 soft, 2 hard and 2 medium hard material types and within their range perform all of the spinning processes stipulated by this unit of competency
- orally or by other methods of communication, answer questions put by an assessor perform the tasks described by this guide, within the time frame established between the candidate's supervisor/instructor and the assessor prior to undertaking this assessment

Special notes

During assessment the individual will:-

- demonstrate safe working practices at all times
- communication information about processes, events or tasks being undertaken to ensure a safe and efficient working environment
- take responsibility for the quality of their own work
- plan tasks in all situations and review task requirements as appropriate
- perform all tasks in accordance with standard operating procedures
- perform all tasks to specification
- use accepted engineering technique, practices, processes and workplace procedures

Unit MEM 7.31A B Perform metal spinning lathe operations (complex)

Band – Specialisation band A

Field – Machine & process operations

Unit Weight 4

This unit covers the competencies required for more unusual or difficult spinning operations, including those requiring more involved calculations and/or processes, or jobs

requiring higher precision or quality using mainly brass and brass alloys. This unit also requires the use of a greater range of spinning accessories including the use of heat.

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices

9.2A Interpret technical drawing

7.30A Perform metal spinning lathe operations (basic)

18.1A Use hand tools

7.32A Use workshop machines for basic operations

18.2A Use power tools/hand held operations

Element 7.31A.1 Observe safety precautions

Criteria 7.31A.1.1

Correct safety procedures observed and protective clothing and safety glasses worn

Assessor guide: observe that –

Appropriate coveralls and footwear are worn and in a serviceable condition All work is carried out correctly and safely in accordance with workplace procedures

Assessor guide: confirm that –

Serviceability and appropriate of use safety wear and safe work practices are maintained

Element 7.31A.2 Determine job requirements

Criteria 7.31A.2.1

Drawings are interpreted and sequence of operation determined

Assessor guide: observe that –

All drawings required are used and that the sequence of operation has been correctly adhered to in accordance with job sheets and workplace practice and procedures

Assessor guide: confirm that –

Information determined from the drawings is clearly understood and accurately applied
Each step of the sequence of operation is able to be properly explained

Criteria 7.31A.2.2

Tools are selected to produce components to specifications

Assessor guide: observe that –

The correct tools are selected throughout spinning operation. All tools selected are properly prepared for use

Assessor guide: confirm that –

The correct tools are selected for shaping, trimming and finishing
The operator is able to determine that each tool has been properly prepared for use

Criteria 7.31A.2.3

Disc size is determined in accordance with appropriate procedures

Assessor guide: observe that –

The correct specifications for the job are properly selected

Assessor guide: confirm that –

The specifications are clearly understood and correctly interpreted

Criteria 7.31A.2.4

Disc is cut to the correct size and tolerance

Assessor guide: observe that –

The disc size has been properly selected and is within drawing tolerance
The correct use of the disc cutter is applied and that the finished disc is within tolerance as specified

Assessor guide: confirm that –

Element 7.31A.3 Prepare form chucks for spinning**Criteria 7.31A.3.1**

Metal turning lathe is set up for machining form chucks in accordance with standard operating procedures and standards

Assessor guide: observe that –

All necessary safety precautions and appropriate operating principles and practices are observed in functioning a metal turning lathe

Assessor guide: confirm that –

The operator has achieved competence on the metal turning lathe and meets the pre-requisite requirements

Criteria 7.31A.3.2

Form chuck is prepared for general spinning as per drawings and specifications

Assessor guide: observe that –

Information from specifications, are applied and any required adjustments to the chuck are appropriately recorded according to workshop and legislative processes and practices

Assessor guide: confirm that –

Any necessary preparation or adjustments are free from defect and spinings are able to be produced to existing or revised specifications, without defect

Criteria 7.31A.3.3

Form chuck is prepared for seaming/swaging joints as per drawings and specifications

Assessor guide: observe that –

Information from specifications, are applied and any required adjustments to the chuck are appropriately recorded according to workshop and legislative processes and practices

Assessor guide: confirm that –

Any necessary preparation or adjustments are free from defects and the spinning seams or swagings produced are able to provide for precise joins to existing or revised specifications, without defect

Element 7.31A.4 Perform spinning operations**Criteria 7.31A.4.1**

Spinning speeds are calculated for various metals and metal thicknesses using appropriate mathematical techniques and reference materials

Assessor guide: observe that –

The operator determine the appropriate speed for the material type and thickness. The lathe speed is set correctly and in accordance with operating procedures

Assessor guide: confirm that –

The operator understands why and how lathe speed is calculated

Criteria 7.31A.4.2

Correct back centre and form chucks are selected and mounted in accordance with procedures and specifications

Assessor guide: observe that –

Form chuck is selected from drawings or specifications, correctly and securely mounted by appropriate means
Back centre is selected and prepared for use in conjunction with an appropriate centre/live centre

Assessor guide: confirm that –

The operator is able to correctly determine the type of form chuck mounting required from 3 possible alternative methods

Criteria 7.31A.4.3

Prepare disc is mounted for forming

Assessor guide: observe that –

Disc is mounted and centred

Assessor guide: confirm that –

Disc properly centred prior to start up to prevent departure on turning

The operator demonstrates safe working practices and ensures that they are positioned outside of the disc's travel path

Criteria 7.31A.4.4

A full range of spinning accessories are used including: back centre, holding and sectional chucks, tee-rest, compound and additional slides, recessed and cranked followers, rollers and knurling wheels

Assessor guide: observe that –

Accessories are appropriately utilised in accordance with operating procedures

Assessor guide: confirm that –

The function and operation of accessory is clearly understood and operated correctly in accordance with the specified procedures

Criteria 7.31A.4.5

Spinning, beading, recessing, oval spinning, screw forming, (thread spinning) seaming, swaging, trimming finishing, annealing and pickling operations are performed to specifications

Assessor guide: observe that –

Operations are accurately performed using the correct tooling and accessories

Assessor guide: confirm that –

All of the processes used, are fully understood and the methods used for each process is applied safely with the correct utilisation of spinning tools

Element 7.31A.5 Check components for conformance to specifications**Criteria 7.31A.5.1**

Components are checked for conformance to specifications using appropriate techniques, tools and equipment

Assessor guide: observe that –

The most appropriate methods of inspection is utilised in determining conformance to specifications All inspection tools and equipment are used in accordance with manufacturer's procedures for inspection

Assessor guide: confirm that –

The operator is able to ensure all work is free from damage and defects including: tool marks, cracking, stress marks, thinning and incorrect finish etc.
The operator is able to identify the purpose and need for the use of inspection tools or equipment and is able to correctly use them as required

Element 7.31A.6 Remove and store components**Criteria 7.31A.6.1**

Components are removed from the spinning lathe without marking or any deformation

Assessor guide: observe that –

Spinning are removed in an appropriate manner for the job at hand and are stacked in order to prevent further damage

Assessor guide: confirm that –

No damage has been incurred during removal and stacking prior to packaging

Criteria 7.31A.6.2

Components are correctly stored and packaged as to avoid oxidation and damage

Assessor guide: observe that –

Spinning is correctly inhibited and packed in accordance with workplace procedures

Assessor guide: confirm that –

The operator is fully conversant in the workplace packing processes and understands the reasons for inhibiting and packing

Range statement

The skills in this unit are applied to more unusual or difficult spinning operations including those requiring more involved calculations and/or processes, or jobs requiring higher precision or quality using mainly brass and brass alloys. This unit also requires the use of a greater range of spinning accessories including the use of heat. Where there is a requirement to join spun materials or products in addition to, or instead of, (the spinning operation of) swaging, either Unit 5.3A (Soft soldering (basic)), Unit 5.6A (Perform brazing and/or silver soldering), or Unit 5.4A (Perform routine oxyacetylene welding (fuel gas welding)), or Unit 5.12A (Perform routine manual arc and/or gas metal arc welding) or all may also be required.

Evidence guide**Assessment context**

This unit should be assessed on the job.

- The competencies covered by this unit would be demonstrated by an individual working alone
- Assessment should be conducted in the individual's own work environment
- Identify colleagues who can be approached for the collection of competency evidence where appropriate.
- Present evidence for credit for any off the job training related to this unit

Critical aspects

Competency in this unit cannot be claimed until pre-requisites have been satisfied.

Where those pre-requisites are factored into this unit as processes etc., then if the pre-requisite is not held, it is strongly recommended that the assessment include the full assessment of the pre-requisite unit.

i.e.: The process of adjusting the form chucks within this unit would require a full assessment of the skills and knowledge covered in Unit 7.6A (Perform lathe

- use accepted engineering technique, practices, processes and workplace procedures

Assessment conditions

The candidate will be provided with:

- All tools, equipment, materials and documentation required
- The candidate will be permitted to refer to the following documents
- Any relevant workplace procedures
- Any relevant product and manufacturing specifications

The candidate will be required to:

- orally or by other methods of communication, answer questions put by an assessor perform the tasks described by this guide, within the timeframe established between the candidates supervisor/instructor and the assessor prior to undertaking this assessment.

Special notes

During assessment the individual will:

- demonstrate safe working practices at all times
- take responsibility for the quality for their own work
- plan tasks in all situations and review task requirements as appropriate
- perform all tasks in accordance with standard operating procedures
- perform all tasks in accordance with standard operating procedures
- perform all tasks to specification

Unit MEM 7.32A A Use workshop machines for basic operations

Band – Specialisation band A

Field – Machine & process operations

Unit Weight 2

Pre-requisite units - Path 1

18.1A Use hand tools

Element 7.32A.1 Determine job requirements

Criteria 7.32A.1.1

Job requirements interpreted.

Assessor guide: observe that –

Any written instructions have been received and used.

Assessor guide: confirm that –

Those instructions have been interpreted correctly.

Criteria 7.32A.1.2

Appropriate machine selected to meet requirements.

Assessor guide: observe that –

The machine selected is appropriate for that machining operation.

Assessor guide: confirm that –

The range of machines and their operations can be identified.

Element 7.32A.2 Set up machine

Criteria 7.32A.2.1

Tools are selected where appropriate.

Assessor guide: observe that –

The tools selected are appropriate for that operation.

Assessor guide: confirm that –

The range of tools for different purposes can be identified.

Criteria 7.32A.2.2

Cutting tools are sharpened as required.

Assessor guide: observe that –

The cutting tools have been sharpened to meet job requirements.

Assessor guide: confirm that –

The consequences of incorrect sharpening can be identified.

Criteria 7.32A.2.3

Tools are correctly installed using standard operating procedures.

Assessor guide: observe that –

The tools holder, tools are held in by using the correct bolting/attachments, to suit the machine.

Assessor guide: confirm that –

The consequences of tool holders, tools being incorrectly secured, can be identified.

Criteria 7.32A.2.4

Appropriate guards are set and adjusted as required.

Assessor guide: observe that –
Guards have been set correctly.

Assessor guide: confirm that –

The consequences of not using guards etc., can be identified.

Element 7.32A.3 Operate machine**Criteria 7.32A.3.1**

Material to be machined is positioned and secured.

Assessor guide: observe that –
The material has been positioned correctly on the machine and that it has been securely clamped and that the clamps will not interfere with the machining operations.

Assessor guide: confirm that –

The various methods and manner of clamping can be identified.

Criteria 7.32A.3.2

Machine operated appropriately to suit job and material requirements.

Assessor guide: observe that –
The machines are used to machine the material in a clamped position, using all necessary safety measures. Appropriate machine settings are used.

Assessor guide: confirm that –

The operation of machines can be identified. Various safety problems can be identified. Consequence of incorrect speeds and feeds understood.

Element 7.32A.4 Check finished component**Criteria 7.32A.4.1**

Machined component checked against requirements and predetermined finish.

Assessor guide: observe that –
The finished component is checked for size against specifications.
The finished machine surface is acceptable.

Assessor guide: confirm that –

The necessary checking procedures have been carried out. The reason for a poorly finished surface, can be identified.

Range statement

Work undertaken autonomously or in a team environment using predetermined standards of quality, safety and workshop procedures. This unit covers basic machining in a maintenance or jobbing environment. The machines include but are not limited to lathe, radial arm drill, mills etc., and covers the sharpening of tools as required. This unit should not be selected when Units 7.5A (Perform general machining) or 7.24A (Operate and monitor machine/process) have already been selected. For hand held/power tools use Unit 18.2A (Use power tools/hand held operations).

Evidence guide

Assessment context

This unit should be assessed on the job, off the job or a combination of on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the routine machining, operations or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to:

- All tools, equipment, materials and documentation required

The candidate will be permitted to refer to the following documents:

- Any relevant workplace procedures
- Any relevant product and manufacturing specifications
- Any relevant codes, standards, manuals and reference materials

The candidate will be required to:

- Orally, or by other methods of communication, answer questions put by the assessor
- Identify colleagues who can be approached for the collection of competency evidence where appropriate
- Present evidence of credit for any off-job training related to this unit

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will:

- demonstrate safe working practices at all times;
- communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment;
- take responsibility for the quality of their own work;
- plan tasks in all situations and review task requirements as appropriate;
- perform all tasks in accordance with standard operating procedures;
- perform all tasks to specification;
- use accepted engineering techniques, practices, processes and workplace procedures.

Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 7.33A A Operate and monitor basic boiler

Band – Specialisation band A

Field – Machine & process operations

Unit Weight 6

Pre-requisite units - Path 1

2.2C11 Organise and analyse information

Pre-requisite units - Path 2

2.2C11 Organise and analyse information

18.1A Use hand tools

7.1A Operational maintenance of machines/equipment

2.5C11 Measure with graduated devices

18.2A Use power tools/hand held operations

18.1A Use hand tools

9.1A Draw and interpret sketch

18.55A Dismantle, replace and assemble engineering components

Element 7.33A.1 Select and use personnel protective equipment

Criteria 7.33A.1.1

Select and use personal protective clothing and equipment.

Assessor guide: observe that –

Personal protective clothing and equipment is selected and used, according to statutory requirements and workplace procedures.

Assessor guide: confirm that –

The reasons for selecting personal protective clothing and equipment can be given.

Element 7.33A.2 Carry out pre-operational checks

Criteria 7.33A.2.1

Conduct pre-operational checks of boiler according to plant operating procedures.

Assessor guide: observe that –

Pre-operational checks of boiler are conducted in accordance with statutory requirements, manufacturer's recommendations and plant operating procedures.

Assessor guide: confirm that –

The pre-operational checks such as feed water supply, boiler water level, fuel supply/heat source, boiler valves their operation and position, combustion air supply and combustion equipment, can be identified.

Criteria 7.33A.2.2

Identify and report maintenance requirements as required.

Assessor guide: observe that –

Maintenance requirements are identified and reported in accordance with workplace procedures.

Assessor guide: confirm that –

The procedures for identifying and reporting maintenance requirements can be given.

Element 7.33A.3 Maintain health and safety standards in work area**Criteria 7.33A.3.1**

Identify and report hazards and potential hazards in work area.

Assessor guide: observe that –

Hazards and potential hazards in work area are identified and reported in accordance with statutory requirements and work place procedures.

Assessor guide: confirm that –

The statutory requirements and work place procedures for identifying and reporting hazards in the work area such as chemical and thermal hazards, manual handling, guarding of machinery, illumination of work area, rubbish and combustibles, leakage of steam and fuel etc. can be given.

Criteria 7.33A.3.2

Select and use prevention/control measures as required.

Assessor guide: observe that –

Prevention/control measures are selected and used in accordance with statutory requirements and workplace procedures.

Assessor guide: confirm that –

The prevention/control measures can be identified. The reason for selecting the prevention/control method can be given.

Element 7.33A.4 Start boiler**Criteria 7.33A.4.1**

Start boiler and bring on line safely consistent with workplace procedures and production requirements.

Assessor guide: observe that –

Boiler is started and brought on line safely, in accordance with statutory requirements, manufacturer's recommendations and workplace procedures.

Assessor guide: confirm that –

The processes for starting a boiler such as, heat input, warm up of the reticulation system, steam traps and steam line purge, systems operation, reticulation line pressure, steam usage and supply can be identified.

Element 7.33A.5 Conduct hand over/take over procedures**Criteria 7.33A.5.1**

Confirm operating status of boiler.

Assessor guide: observe that –

Operating status of boiler is confirmed in accordance with manufacturer's recommendations and workplace procedures.

Assessor guide: confirm that –

The processes for confirming operational status of boiler can be identified.

Criteria 7.33A.5.2

Maintain operating log and communicate boiler status and operation according to workplace procedures.

Assessor guide: observe that –

Operating log is maintained clearly and accurately, in accordance with statutory requirements and workplace procedures.

Boiler status and operation is communicated in accordance with statutory requirements and workplace procedures.

Assessor guide: confirm that –

The procedures for maintaining operating log can be given. The procedures for communicating boiler status and operation can be given.

Element 7.33A.6 Operate and monitor boiler**Criteria 7.33A.6.1**

Boiler operated consistent with production and safety requirements.

Assessor guide: observe that –

Boiler is monitored in accordance with statutory requirements manufacturer's recommendations and workplace procedures.

Assessor guide: confirm that –

The procedures for monitoring a boiler such as, steam reticulation line pressure, usage, supply and quality of steam, combustion/heat source system, feed water system, fuel system combustion air supply, water level, boiler steam pressures and operation of control/safety devices etc. can be identified.

Criteria 7.33A.6.2

Conduct boiler water quality tests to manufacturer's recommendations and workplace procedures.

Assessor guide: observe that –

Boiler water quality tests are conducted in accordance with manufacturer's recommendations and workplace procedures.

Assessor guide: confirm that –

The procedures for conducting boiler water quality tests can be identified.

Criteria 7.33A.6.3

Adjust boiler water quality as required to manufacturer's recommendations and workplace procedures.

Assessor guide: observe that –

Boiler water quality is adjusted according to manufacturer's recommendations and workplace procedures.

Assessor guide: confirm that –

The procedures for adjusting boiler water quality can be identified.

Criteria 7.33A.6.4

Respond to boiler failures/emergencies and notify downstream users.

Assessor guide: observe that –

Boiler failures/emergencies are responded to in accordance with statutory requirements, manufacturer's recommendations and workplace procedures.

Assessor guide: confirm that –

The procedures such as identification of emergency isolation of heat source, operation of boiler, selection and application of appropriate fire fighting equipment and notification of downstream users etc. can be identified.

Element 7.33A.7 Carry out boiler operational shut-down**Criteria 7.33A.7.1**

Shut down boiler consistent with workplace procedures, production and safety requirements.

Assessor guide: observe that –

Operational boiler is shut down is performed in accordance with statutory requirements, manufacturer's recommendations and workplace procedures.

Assessor guide: confirm that –

The processes and procedures such as confirming water level, cooling down, boiler pressure/vacuum and fuel/heat source isolation etc. when operationally shutting down a boiler can be identified.

Element 7.33A.8 Carry out boiler shut-down for an internal inspection**Criteria 7.33A.8.1**

Shut down boiler for internal inspection manufacturer's recommendations and workplace procedures.

Assessor guide: observe that –

Boiler is shut down for internal inspection in accordance with statutory requirements, manufacturer's recommendations and workplace procedures.

Assessor guide: confirm that –

The processes and procedures such as confirming boiler cooling down, vacuum/pressure, fuel/heat source isolation, removal of combustion equipment and water from boiler, isolation from any common connection and the opening of all access points required for inspection etc. can be identified.

Criteria 7.33A.8.2

Clean boiler internally and externally to manufacturer's recommendations and workplace procedures.

Assessor guide: observe that –

Boiler is cleaned internally and externally according to statutory requirements, manufacturer's recommendations and workplace procedures.

Assessor guide: confirm that –

The procedures for cleaning the boiler internally and externally can be identified.

Element 7.33A.9 Store boiler in shut-down mode**Criteria 7.33A.9.1**

Identify the appropriate mode of storage.

Assessor guide: observe that –

Assessor guide: confirm that –

The various modes of boiler storage can be given. The reason for selecting the mode of boiler storage can be given.

Criteria 7.33A.9.2

Store the boiler in shut-down mode to manufacturer's recommendations and work place procedures.

Assessor guide: observe that –

Boiler is stored in accordance with statutory requirements, manufacturer's recommendations and work place procedures.

Assessor guide: confirm that –

The procedures for storing the boiler in shut-down mode can be identified.

Range statement

This unit covers the start up, take over/hand over and shut down of a basic boiler. Work is undertaken autonomously or as part of a team, to predetermined standards of quality and safety. Work includes inspection procedures as specified in the manufacturer's recommendations and workplace procedures, identification of maintenance requirements and hazard control measures. All work carried out to State/Territory OHS legislation, standards and codes of practice. The boilers covered by this unit would have the following features: Single fixed combustion air supply, non-modulating single heat source and fixed firing rate, and covers boilers used for all purposes including the generation of steam.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with either maintenance or production/process work, or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 8.1A A Wire, jig and barrel load/unload work

Band – Specialisation band A

Field – Surface finishing

Unit Weight 4

Element 8.1A.1 Load barrels etc., for mass finishing processes

Criteria 8.1A.1.1

Machinery is correctly loaded regarding load mass.

Assessor guide: observe that –

The components are correctly loaded into the surface finishing machinery in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for loading machinery for mass finishing processes can be given. The distribution of the components within the machinery can be identified. The reasons for distributing the components in the manner selected can be explained.

Criteria 8.1A.1.2

Machine access openings are safely secured.

Assessor guide: observe that –

The machine access openings are correctly secured in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for securing machine access openings can be given. The consequences of not securing machine access openings can be given.

Element 8.1A.2 Jig work for non-electrolytic processes

Criteria 8.1A.2.1

Components are appropriately secured using standard operating procedures.

Assessor guide: observe that –

Where appropriate, the components to be surface finished using a non-electrolytic process are correctly secured in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for jiggling work for non-electrolytic processes can be given. The precautions to be taken when jiggling work for non-electrolytic finishing processes can be identified.

Element 8.1A.3 Wire jig and rack work for electrolytic processes**Criteria 8.1A.3.1**

Correct type and size of wire or rack is selected and inspected for conformance to specification. Damaged racks are identified for repair or replacement.

Assessor guide: observe that –

Assessor guide: confirm that –

The type and size of wire or rack appropriate for use in conjunction with surface finishing using electrolytic processes can be identified. The reasons for selecting the chosen size and type of wire or rack can be given.

Criteria 8.1A.3.2

Components are secured presenting appropriate faces according to standard operating procedure.

Assessor guide: observe that –

Where appropriate, the components to be surface finished using an electrolytic process are correctly secured in accordance with standard operating procedures.

Assessor guide: confirm that –

The faces to be surface finished/ coated can be identified. The procedures for securing the components to be surface finished using electrolytic processes can be given.

Element 8.1A.4 Unload, remove jigs after finishing**Criteria 8.1A.4.1**

Components are unloaded and stacked without causing damage to finish using standard operating procedures.

Assessor guide: observe that –

Surface finished components are unloaded and stacked in a manner to minimise damage in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for unloading and stacking surface finished components can be given. The damage that can be caused by inappropriate handling and storing of surface finished components can be identified.

Range statement

Work is undertaken autonomously or in a team environment, using predetermined standards of quality, safety and operating procedures. This unit applies to loading and unloading in preparation for a wide variety of pre-treatment and finishing processes of multiples of similar items. Typical processes include degreasing, de-scaling, surface blasting, flame cleaning, wet blasting, grinding, polishing, wet coating, powder coating, electroplating, anodising, electroless plating, electrophoretic coating and hot dip metallising.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with wiring, jiggling and loading of barrels for surface finishing processes or other units requiring the exercise of the skills and knowledge covered by this unit. To be assessed as competent in this unit, the individual must jig work for at least one of the surface finishing processes identified in elements 8.1A.2 and 8.1A.3. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 8.2A B Pre-treat work for subsequent surface coating

Band – Specialisation band A

Field – Surface finishing

Unit Weight 4

This unit covers the competencies required for pre-treating common ferrous and non-ferrous work. It can apply to a range of different finishing processes, such as wet coating, powder coating, electroplating, anodising, electroless plating, electrophoretic coating and hot dip metallising.

Pre-requisite units - Path 1

13.3A Work safely with industrial chemicals and materials

Element 8.2A.1 Identify job material

Criteria 8.2A.1.1

Common metals, alloys and non-metals are recognised

Assessor guide: observe that –

Common metals, alloys and non-metals can be identified from given samples

Assessor guide: confirm that –

The characteristics of common metals, alloys and non-metals can be identified The procedures and techniques for identifying common metals, alloys and non-metals can be given Simple tests that can be used to assist in the identification of common metals, alloys and non-metals can be described

Element 8.2A.2 Identify job surface condition

Criteria 8.2A.2.1

Common surface soils and conditions are recognised

Assessor guide: observe that –

Common surface soils and conditions can be identified from given samples

Assessor guide: confirm that –

The common surface soils and conditions can be identified The procedures for identifying the type(s) of soil on surfaces to be finished can be given Simple tests that can be used to assist in identifying surface soils and conditions can be described

Element 8.2A.3 Perform pre-treatment processes in correct sequence

Criteria 8.2A.3.1

Pre-treatment processes carried out following standard operating procedures

Assessor guide: observe that –

The appropriate pre-treatment processes are carried out in accordance with standard operating procedures

Assessor guide: confirm that –

The pre-treatment processes applicable to a range of materials can be identified The pre-treatment processes applicable to a range of surface soils and conditions can be identified The procedures for carrying out pre-treatment processes can be given The pre-treatment processes most suitable for given materials, surface soils and conditions can be identified The reasons for selecting the chosen pre-treatment process can be explained

Criteria 8.2A.3.2

Pre-treatment process parameters are monitored to ensure they remain within specified limits

Assessor guide: observe that –

The pre-treatment process parameters are monitored and maintained within specified limits in accordance with standard operating procedures

Assessor guide: confirm that –

The parameters to be monitored when using different pre-treatment processes can be identified The procedures for monitoring those parameters can be given The limits within which the pre-treatment process parameters are to be maintained can be identified

Range statement

Work is undertaken autonomously or in a team environment, using predetermined standards of quality, safety and operating procedures. Typical pre-treatment processes include solvent and aqueous degreasing, pickling, de-scaling, bright dipping, rinsing, pre-plate dipping etc. This unit applies to pre-treatment of common ferrous and non-ferrous work for finishing by a wide variety of processes, typical of which are, but not limited to: wet coating, powder coating, electroplating, anodising, electroless plating, electrophoretic coating and hot dip metallising. Adjustments to apparatus/equipment/controls include temperature settings, current/voltage and solution compositions. This unit should not be selected if Unit 8.3A (Perform electroplating operations) has already been selected.

Evidence guide**Assessment context**

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the pre-treating of work for subsequent surface coatings or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 8.3A B Perform electroplating operations

Band – Specialisation band A

Field – Surface finishing

Unit Weight 6

This unit covers the competencies required to start up, operate and monitor an electroplating process. It includes recognising and rectifying deviations and faults in product/equipment/process. It applies to production and jobbing operations in protective coating, engineering or decorative processes. A basic knowledge of electroplating solutions and handling procedures is required. This unit applies across a range of metal plating processes in the electroplating, electronics, jewellery manufacture, and metal fabrication industries.

Pre-requisite units - Path 1

7.1A Operational maintenance of machines/equipment
18.1A Use hand tools

8.1A Wire, jig and barrel load/unload work

13.3A Work safely with industrial chemicals and materials

Element 8.3A.1 Identify electroplating requirements

Criteria 8.3A.1.1

Electroplating requirements are identified

Assessor guide: observe that –

Relevant information for plating is identified from drawings, job instructions and specifications Machine/process requirements are identified, including raw materials, required finish, appropriate settings

Assessor guide: confirm that –

Information relevant to plating products, treatment baths, settings is understood

Criteria 8.3A.1.2

Untreated materials and required electroplating treatment identified

Assessor guide: observe that –

Untreated materials and treatments stages are correctly identified

Assessor guide: confirm that –

A variety of base materials that can be plated can be identified Pre-treatments, treatments and post treatments can be identified in relation to task requirements

Element 8.3A.2 Prepare for electroplating process

Criteria 8.3A.2.1

Materials and racking arrangement checked for non-conformance to specifications/job requirements

Assessor guide: observe that –

All incorrectly loaded work is rejected Job surface condition is inspected Faults and imperfections are identified and reported

Assessor guide: confirm that –

The procedures for rejecting incorrectly loaded work can be given Effects of rust, corrosion and other contaminants can be explained

Criteria 8.3A.2.2

All plant and equipment relevant to process checked for compliance with safety and operational requirements

Assessor guide: observe that –

All plant and equipment is checked for conformance to safety and operational requirements in accordance with standard operating procedures Equipment checked includes componentry, electrodes, circuitry equipment, solution temperature, agitation equipment, filtration and fume extraction

Assessor guide: confirm that –

Required equipment checks can be explained Purpose of checking equipment for correct operation can be explained The procedures for checking all plant and equipment associated with the relevant process can be given The hazards associated with electroplating processes can be identified The operational requirements of all plant and equipment associated with the relevant process can be identified

Criteria 8.3A.2.3 Instrumentation/gauges are checked for operation	<i>Assessor guide: observe that –</i> Voltage, amperage, temperature readings are checked and confirmed	<i>Assessor guide: confirm that –</i> Different instruments/gauges, their purpose and typical settings can be given
Criteria 8.3A.2.4 Condition of solution is checked	<i>Assessor guide: observe that –</i> Solution levels checked in accordance with standard operating procedure Visible contamination identified such as solution clarity, oil, surface contamination	<i>Assessor guide: confirm that –</i> Effects of contamination can be explained
Element 8.3A.3 Criteria 8.3A.3.1 Operation steps are carried out in correct sequence according to standard operating procedure or work instructions	Perform electroplating operations <i>Assessor guide: observe that –</i> Materials are moved from tank to tank in correct sequence Significant surfaces are fully immersed Satisfactory electrical contacts are maintained Correct times are observed for each tank Carry-over is minimised Correct distance from electrodes is maintained	<i>Assessor guide: confirm that –</i> Importance of avoiding carry over, fully immersing significant surfaces and maintaining treatment times understood Importance of maintaining satisfactory electrical contact is understood
Criteria 8.3A.3.2 Safety precautions are observed	<i>Assessor guide: observe that –</i> Personal protective equipment is worn when necessary Safe handling procedures are followed	<i>Assessor guide: confirm that –</i> The need for personal protective equipment and hazards associated with the electroplating process can be given
Element 8.3A.4 Criteria 8.3A.4.1 Compliance with operating parameters is ensured and treatment deviations are identified and appropriate	Recognise and rectify process deviations <i>Assessor guide: observe that –</i> Operating parameters are monitored for accuracy Product parameters can be identified, including voltage, current and adjustments made according to standard operating procedure	<i>Assessor guide: confirm that –</i> The range of adjustments permissible for given operating temperature
Criteria 8.3A.4.2 Uncontrollable variances are reported to appropriate persons	<i>Assessor guide: observe that –</i> Correct reporting procedure is followed	<i>Assessor guide: confirm that –</i> Variances outside the control of the operator can be identified and explained
Criteria 8.3A.4.3 Adjustments are made to rectify process deviation	<i>Assessor guide: observe that –</i> Product faults/deviations are rectified by adjustment of settings such as voltage, current and temperature within permissible limits and in accordance with job sheets, standard operating procedure or other documentation	<i>Assessor guide: confirm that –</i> Common faults and imperfections/deviations can be identified Adjustments to suit specific process deviations can be given

Criteria 8.3A.4.4

Finished products are visually inspected for compliance to specification

Assessor guide: observe that –

Faulty and abnormal appearance and deviations beyond the control of the operator are reported to appropriate authority Corrective actions within operator control are identified

Assessor guide: confirm that –

Faults, abnormal appearances and their causes can be given Corrective actions for specific problems can be given

Range statement

This unit covers the general operation, monitoring and adjustment of manual, semi and automatic electroplating processes. It includes volume production and "jobbing" involving rack and barrel type processes. Relevant industries include electroplating, electronics, jewellery manufacture, metal fabrication industries. Electroplating applications may typically include engineering coatings, protective finishes, decorative plating. Work may be performed autonomously, or in a team. Work is performed to established processes, practices and standards of quality, safety and workshop procedures. Straightforward adjustment to process settings relates to controllable variances within defined parameters and according to standard operating procedure. Knowledge of safe operating procedures, safety and personal protective equipment, hazards of specific solutions is required. Work instructions may include standard operating procedures, verbal and written job instructions, job cards, specifications, drawings. Basic knowledge of electroplating process, machine components, treatment solutions, process parameters is covered by this unit. This unit should not be selected if Unit 7.25A (Advanced machine/process operation) has already been selected. Where simple operating and monitoring of the electroplating process is required Unit 7.24A (Operate and monitor machine/process) should be considered.

Evidence guide**Assessment context**

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the finishing of work using electroplating solutions or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 8.4A A Finish work using wet, dry and vapour deposition methods

Band – Specialisation band A

Field – Surface finishing

Unit Weight 4

Pre-requisite units - Path 1

8.2A Pre-treat work for subsequent surface coating

13.3A Work safely with industrial chemicals and materials

Element 8.4A.1 Assess preparation of work for correct coating process

Criteria 8.4A.1.1

Drawings and/or operation sheets are interpreted and understood for coating specification and components are racked accordingly.

Assessor guide: observe that –

All relevant drawings, specifications and/or instructions are obtained in accordance with work place procedures. The components to be coated are correctly racked in accordance with standard operating procedures.

Assessor guide: confirm that –

The work to be undertaken can be identified. The coating process to be used can be identified. The coating specifications can be identified. The appropriate type of racking for the coating process can be identified. The reasons for selecting the chosen rack type can be explained. The procedures for racking components to be coated can be given.

Element 8.4A.2 Performs simple mixing and estimating operations

Criteria 8.4A.2.1

Mixing ratios calculated and a range of wet coatings mixed and thinned as required to standard operating procedure.

Assessor guide: observe that –

The correct mixing ratios for given wet coatings are calculated accurately. Where appropriate the given wet coatings are mixed and thinned where required in accordance with standard operating procedures.

Assessor guide: confirm that –

The source of data on mixing ratios for wet coatings can be identified. The mixing ratio for the given task(s) can be identified. The function of thinners as applied to the application of wet coatings can be explained. The procedures to be followed when mixing wet coatings can be given.

Criteria 8.4A.2.2

Quantities of wet coatings required estimated using simple surface area calculations.

Assessor guide: observe that –

The surface area to be coated is calculated correctly. Where appropriate the quantities of wet coating materials are correctly estimated in accordance with standard operating procedures.

Assessor guide: confirm that –

The surface area to be coated can be identified. The coverage rate of the coating material to be applied can be identified. The procedures for estimating quantities of coating materials can be explained.

Element 8.4A.3 Perform coating operation**Criteria 8.4A.3.1**

Equipment set up to specification using standard operating procedures.

Assessor guide: observe that –

The appropriate coating equipment is set up in accordance with specifications and standard operating procedures.

Assessor guide: confirm that –

The types of equipment used for a variety of coating processes can be identified. The appropriate coating equipment for the given task(s) can be identified. The reasons for selecting the chosen equipment can be explained. The operating procedures applicable to the selected coating equipment can be identified.

Criteria 8.4A.3.2

Coating and applied curing technique monitored to standard operating procedure.

Assessor guide: observe that –

The coating is correctly applied using the appropriate technique in accordance with standard operating procedures. The coating is correctly cured using the appropriate technique in accordance with standard operating procedures. The coating and curing process are monitored for correct operation in accordance with standard operating procedures. Where appropriate, coating defects are rectified/reported in accordance with standard operating procedures.

Assessor guide: confirm that –

A range of coating techniques can be identified. A range of curing techniques can be identified. The appropriate coating and curing technique for the given task(s) can be identified. The reasons for selecting the chosen coating and curing techniques can be explained. The monitoring procedures to be followed can be identified. Examples of coating defects can be given. The causes of coating defects can be explained. Where appropriate, the procedures for rectifying coating defects can be identified. Where appropriate, the procedures for reporting coating defects can be identified.

Criteria 8.4A.3.3

Coating thickness and colour checked and maintained for compliance with specifications.

Assessor guide: observe that –

The coating thickness and colour is maintained in accordance with specifications throughout the coating operation. The coating thickness and colour is checked in accordance with standard operating procedures.

Assessor guide: confirm that –

The coating thickness and colour to be achieved can be identified. The means of checking coating thickness and colour can be identified. The frequency at which checks are undertaken can be identified.

Range statement

This unit applies to finishing work using a range of wet and dry organic coatings, typical of which are electrostatic powder coating, electrophoretic coating, industrial spray coating and lacquering, electroless" (auto catalytic) nickel or copper plating, phosphating, chromating, galvanising, hot tinning, sputter deposition, vacuum evaporation, ion plating, paints, stains and other liquid finishes. Processing may be carried out in manual, semi or fully automatic plant. Applications may be by hand or utilising a wide range of machines or plants. Where straightforward monitoring of semi or automatic machine or process is undertaken, then Unit 7.24A (Operate and monitor machine/process) should be considered.

Evidence guide

Assessment context

This unit should be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the finishing of work using wet, dry and vapour deposition methods or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 8.5A A Prepare and produce specialised coatings

Band – Specialisation band A

Field – Surface finishing

Unit Weight 4

This unit covers the competencies required to prepare and produce specialised industrial films on a variety of work pieces, often on a one-off basis. Typical of the coatings are heavy (hard) chromium or nickel, heavy electroless nickel, "hard" anodising and selective (brush) plating; also included is the electrodeposition of "difficult"

metals such as iron and certain alloys.

Pre-requisite units - Path 1

8.2A Pre-treat work for subsequent surface coating

13.3A Work safely with industrial chemicals and materials

Element 8.5A.1 Mask and jig work

Criteria 8.5A.1.1

Jigs are secure and masking is adherent and stable

Assessor guide: observe that –

The electroplating jigs are secure The masking is in place and is stable

Assessor guide: confirm that –

The procedures for ensuring that jigs are secure can be given The reasons for masking work being electroplated can be given The materials that are to be used for masking purposes can be identified The procedures for securing the masking material in place can be given

Criteria 8.5A.1.2

Necessary auxiliary electrodes and shields are incorporated effectively

Assessor guide: observe that –

Where appropriate, auxiliary electrodes and shields are set up in accordance with standard operating procedures

Assessor guide: confirm that –

The reasons for using auxiliary electrodes and shields can be explained The procedures for mounting/setting up auxiliary electrodes and shields can be given

Criteria 8.5A.1.3

Necessary jigs and shields are manufactured

Assessor guide: observe that –

Where appropriate, jigs and shields are manufactured in accordance with specifications and standard operating procedures

Assessor guide: confirm that –

The specifications of the jigs and shields to be manufactured can be identified The procedures for manufacturing jigs and shields can be given

Element 8.5A.2 Determine operating parameters

Criteria 8.5A.2.1

Plating knowledge and/or specifications applied in correctly computing operating times, currents and/or voltages

Assessor guide: observe that –

The operating parameters are correctly calculated

Assessor guide: confirm that –

The procedures and formulae for calculating operating times, currents and voltages can be given The specifications of the surface finish to be achieved can be identified

Element 8.5A.3 Pre-treat and treat work

Criteria 8.5A.3.1

Work treated in accordance with specifications using standard operating procedures

Assessor guide: observe that –

The work is treated in accordance with specifications and standard operating procedures

Assessor guide: confirm that –

The procedures for pre-treating the work can be given
The procedures for treating the work after electroplating can be given
The pre and post-electroplating treatment specifications can be identified
The reasons for pre and post-electroplating treatment of surfaces can be explained

Range statement

This unit applies to specialised production of industrial films on a variety of work pieces, often on a one-off basis. Typical of the coatings are heavy (hard) chromium or nickel, heavy electroless nickel, "hard" anodising and selective (brush) plating; also included is the electrodeposition of "difficult" metals such as iron and certain alloys.

Evidence

Assessment context

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the production of specialised coatings electrolytically or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the Criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 8.6A A Produce clear and/or coloured and/or sealed anodised films on aluminium

Band – Specialisation band A

Field – Surface finishing

Unit Weight 2

Pre-requisite units - Path 1

8.2A Pre-treat work for subsequent surface coating

Element 8.6A.1 Perform a series of anodising steps

Criteria 8.6A.1.1

All steps are carried out in the correct sequence according to standard operating procedure.

Assessor guide: observe that –

All steps in the aluminium anodising process are carried out in the correct sequence in accordance with standard operating procedures.

Assessor guide: confirm that –

The steps to be carried out in anodising aluminium can be identified. The correct sequence of the steps can be identified. The procedures to be followed when anodising aluminium can be given.

Criteria 8.6A.1.2

Correct masking techniques used where required.

Assessor guide: observe that –

Where appropriate, the correct masking materials and techniques are used in accordance with standard operating procedures.

Assessor guide: confirm that –

The reasons for masking surfaces during the anodising process can be given. The materials and techniques to be used for masking purposes can be identified. The procedures for masking materials during anodising can be given.

Criteria 8.6A.1.3

Correct action is taken to minimise contact marks and shielding.

Assessor guide: observe that –

The anodising process is carried out in a manner which minimises contact marks and shielding.

Assessor guide: confirm that –

The causes of contact marks and shielding during the anodising process can be identified. The procedures for minimising contact marks and shielding can be given.

Element 8.6A.2 Assess preparation of work for correct jigging/loading

Criteria 8.6A.2.1

Work is correctly connected for the required current flow and minimum contact marks and shielding.

Assessor guide: observe that –

The work is correctly connected to the required electrical current in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for connecting the work to the required electrical current can be given. The electrical current required for the anodising process can be identified.

Criteria 8.6A.2.2

All incorrectly loaded work is rejected.

Assessor guide: observe that –

All incorrectly loaded work is rejected in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for rejecting incorrectly loaded work can be given.

Element 8.6A.3 Anodise work by a series of treatment steps**Criteria 8.6A.3.1**

All steps are carried out in the correct sequence according to standard operating procedure.

Assessor guide: observe that –

All steps in the anodising process are carried out in the correct sequence in accordance with standard operating procedures.

Assessor guide: confirm that –

Element 8.6A.4 Seal or dye and seal anodised work**Criteria 8.6A.4.1**

All steps on work are carried out in the correct sequence according to standard operating procedure.

Assessor guide: observe that –

All steps in the sealing/dye and seal process are carried out in the correct sequence in accordance with standard operating procedures.

Assessor guide: confirm that –

The steps to be carried out in the seal/dye and seal process can be identified. The correct sequence of the steps can be identified. The procedures to be followed in the seal/dye and seal process can be given.

Element 8.6A.5 Monitor and control operating parameters**Criteria 8.6A.5.1**

Ensure process parameters remain within specified limits.

Assessor guide: observe that –

The process parameters are maintained within specified limits in accordance with standard operating procedures.

Assessor guide: confirm that –

The process parameters to be maintained can be identified. The limits within which each process parameter is to be maintained can be identified. The procedures for monitoring and maintaining the process parameters within the specified limits can be given.

Range statement

Applies to the production of sealed anodised films on aluminium and its alloys. Films may be clear or coloured; colouring is produced by dying or by "in bath" processes. Applications include electrical, decorative, mechanical and architectural purposes.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the anodising of aluminium or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 8.7A A Control surface finish production and finished product quality

Band – Specialisation band A

Field – Surface finishing

Unit Weight 4

Element 8.7A.1 Understand principles of quality assurance

Criteria 8.7A.1.1

Apply quality assurance standards as per enterprise specifications.

Assessor guide: observe that –

The quality assurance standards are applied in accordance with enterprise procedures.

Assessor guide: confirm that –

The quality assurance standards as applied to surface finish production and product quality can be identified.

Element 8.7A.2 Apply research or quality data to production process

Criteria 8.7A.2.1

Liaises with in-house/external control laboratories.

Assessor guide: observe that –

Appropriate liaison occurs between the individual and the control laboratory in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for liaising with internal/external control laboratories can be given. The role of the control laboratory can be identified.

Criteria 8.7A.2.2

Correctly interprets data and demonstrates understanding in recommending process changes.

Assessor guide: observe that –

All relevant test and/or production data is obtained in accordance with standard operating procedures. Where appropriate, changes to the process are recommended in accordance with standard operating procedures.

Assessor guide: confirm that –

Surface finish specifications can be identified. Any deviations of test/production data from specifications can be identified. The likely causes of those deviations can be explained. The procedures for recommending changes to the surface finishing process can be given.

Criteria 8.7A.2.3

Process changes are effectively implemented.

Assessor guide: observe that –

Where appropriate, the changes to the surface finishing process are implemented in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for implementing changes to the surface finishing process can be given.

Criteria 8.7A.2.4

Computes and/or makes changes/corrections to processes using laboratory/research data.

Assessor guide: observe that –

The changes to process parameters are calculated on the basis of test and production data collected.

Assessor guide: confirm that –

The procedures and formulae for determining process parameters can be given. The effect of varying process parameters on the specification of the surface finish can be explained.

Element 8.7A.3 Perform quality tests to industry standards**Criteria 8.7A.3.1**

Testing performed as required by standard operating procedures.

Assessor guide: observe that –

The surface coating is tested for conformance with specification using appropriate tests, testing equipment and techniques in accordance with standard operating procedures.

Assessor guide: confirm that –

The tests applicable to surface coatings can be identified. The equipment and techniques necessary to carry out those tests can be identified. The procedures for testing surface coatings for conformance to specification can be given.

Range statement

Finished product quality control can include tests for hardness, adhesion, deposit stress, thickness, corrosion, resistance and appearance, using standard instruments and methods. Analyses are confined to the use of basic instruments such as pH meters, hydrometers, stalagmometers, laboratory balances.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the control of surface finish production and product quality or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 8.8A A Operate and control surface finishing waste treatment process

Band – Specialisation band A

Field – Surface finishing

Unit Weight 3

Pre-requisite units - Path 1

13.3A Work safely with industrial chemicals and materials

Element 8.8A.1 Load waste product

Criteria 8.8A.1.1

Waste from production process obtained via established procedures.

Assessor guide: observe that –

The waste from the production process is obtained safely in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for obtaining waste from the production process can be given. The hazards associated with handling waste products can be identified. The appropriate personal protective equipment and clothing can be identified.

Criteria 8.8A.1.2

Waste loaded in accordance with standard operating procedures for waste/effluent.

Assessor guide: observe that –

The waste is safely loaded in accordance with standard operating procedures.

Assessor guide: confirm that –

The storage requirements of the waste/effluent can be identified. The procedures for loading the stored waste/effluent for transport can be identified. The safety precautions to be taken when handling/loading the waste/ effluent can be identified.

Element 8.8A.2 Monitor plant for waste by-products

Criteria 8.8A.2.1

All process parameters are accurately monitored and recorded to identify waste/effluent.

Assessor guide: observe that –

All process parameters are monitored in accordance with standard operating procedures. The process parameters are accurately recorded in accordance with standard operating procedures. The condition of waste/effluent is identified from the process parameters recorded.

Assessor guide: confirm that –

The process parameters to be monitored can be identified. The procedures for monitoring process parameters and identifying waste/effluent can be given. The procedures for recording process parameters can be given.

Criteria 8.8A.2.2

Recording devices are checked for correct/continuous operation.

Assessor guide: observe that –

The recording devices are checked for correct/continuous operation in accordance with standard operating procedures.

Assessor guide: confirm that –

The process parameter recording devices can be identified. The procedures for checking process parameter recording devices can be given.

Element 8.8A.3 Adjust process**Criteria 8.8A.3.1**

Knowledge of waste treatment processes applied in determining appropriate adjustments.

Assessor guide: observe that –

Appropriate adjustments are made to the waste treatment process in accordance with standard operating procedures.

Assessor guide: confirm that –

The adjustments that can be made to the waste treatment process and their effect on the condition of the waste can be explained. The procedures for adjusting process parameters can be given.

Criteria 8.8A.3.2

Process parameters checked to ensure they remain within specified limits.

Assessor guide: observe that –

Process parameters are checked for conformance to specification in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for checking process parameters can be given. The specified limits for each process parameter can be identified.

Criteria 8.8A.3.3

All adjustments are made to accord with authority requirements with regard to waste.

Assessor guide: observe that –

The condition of the waste is maintained in accordance with the requirements of the relevant authority by making appropriate adjustments to the process parameters.

Assessor guide: confirm that –

The relevant authority with respect to the handling/disposal of waste can be identified. The authority's waste specifications can be identified.

Criteria 8.8A.3.4

In the event of mechanical failure, appropriate corrective action is undertaken.

Assessor guide: observe that –

Where appropriate, a suitable corrective action is taken in response to a mechanical failure in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for handling waste in the event of a mechanical failure can be given. The corrective action to be taken can be identified. The reasons for taking the proposed corrective action can be given. The legislative and regulatory requirements relating to waste management can be identified. The possible effects of surface finishing waste on the environment can be explained.

Range statement

This unit applies to the purification of metal finishing effluent waters which typically contain cyanides, hexavalent chromium, heavy metal cations, certain anions, greases, etc. Methods used may include chemical treatments, grease entrapment, metals precipitation and separation, ion exchange, reverse osmosis and gas scrubbing; and involve full or partial recovery of waste waters and chemicals. Process parameters may include; pH, Oxidisation Reduction Potential (REDOX) or temperature.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the operation and control of surface finishing waste treatment processes or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 8.9A B Make up solutions

Band – Specialisation band A

Field – Surface finishing

Unit Weight 2

This unit covers the competencies required to make up solutions and maintain process specific equipment, such a probes and electrodes. Maintenance of solution ratio and purity is covered by other units.

Pre-requisite units - Path 1

13.3A Work safely with industrial chemicals and materials

Element 8.9A.1 Prepare solution

Criteria 8.9A.1.1

Identify appropriate solution for application requirements or specifications

Assessor guide: observe that –

All relevant job instructions, specifications, etc. are obtained in accordance with workplace procedures

Assessor guide: confirm that –

The application for which the solution is required can be identified The appropriate solutions for a range of applications can be identified The reason for selecting the chosen solutions can be given

Criteria 8.9A.1.2

Volumes, density and solution concentration calculated for effective operation

Assessor guide: observe that –

Assessor guide: confirm that –

The relevant areas, volumes, density and solution concentration are calculated The procedures for determining the appropriate solution concentration can be given The effect of solution concentration on the efficiency of the surface finish process can be identified

Criteria 8.9A.1.3

Suitable volume of solution made up from supplier's instructions and/or manual in accordance with standard operating procedures

Assessor guide: observe that –

A suitable volume of the appropriate solution is prepared in accordance with standard operating procedures

Assessor guide: confirm that –

The procedures for making up suitable volumes of the solution for the surface finishing process can be given The specification of the solution to be made up can be identified

Criteria 8.9A.1.4

Spent solutions are referred to waste treatment processing in accordance with standard operating procedures

Assessor guide: observe that –

Spent solutions are sent for waste treatment in accordance with standard operating procedures

Assessor guide: confirm that –

The procedures for sending spent solutions for waste treatment can be given

Element 8.9A.2 Maintain process specific equipment**Criteria 8.9A.2.1**

Inspection of probes and electrodes carried out and meter probes recalibrated as required

Assessor guide: observe that –

Probes and electrodes are inspected in accordance with standard operating procedures Where appropriate, meter probes are calibrated using appropriate equipment and techniques in accordance with standard operating procedures

Assessor guide: confirm that –

The procedures for inspecting probes and electrodes can be given The procedures for recalibrating meter probes can be given The equipment and techniques necessary to recalibrate meter probes can be given

Range statement

Work undertaken autonomously and/or in a team environment. Standard operational procedures for solution preparation include compliance with standards, codes, legislation, company and customer requirements. This unit should not be selected if Unit 18.18A (Electroplate engineering coatings), Unit 18.19A (Electroplate protective coatings) and/or Unit 18.20A (Electroplate decorative coatings) has been selected.

Evidence guide**Assessment context**

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the maintenance of basic surface finishing solutions or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 8.10A A Manually finish/polish materials

Band – Specialisation band A

Field – Surface finishing

Unit Weight 6

Pre-requisite units - Path 1

18.1A Use hand tools

Element 8.10A.1 Select appropriate finishing procedure

Criteria 8.10A.1.1

Surface finish specifications understood and correct procedure selected.

Assessor guide: observe that –

All relevant job instructions, drawings and specifications are obtained in accordance with work place procedures.

Assessor guide: confirm that –

The work to be undertaken can be identified. The material to be finished/polished can be identified. The specifications of the surface finish can be identified. The methods of finishing/polishing materials can be identified. The applications of each finishing/ polishing method in terms of the materials to be finished/polished and the surface finished to be achieved can be identified. The most appropriate finishing/ polishing method for the work to be undertaken can be identified. The reasons for selecting the chosen finishing method can be given.

Criteria 8.10A.1.2

Appropriate finish and/or polishing equipment/media selected.

Assessor guide: observe that –

Assessor guide: confirm that –

Element 8.10A.2 Install and set up grinding and polishing devices

Criteria 8.10A.2.1

Endless belt liners fitted according to standard operating procedure.

Assessor guide: observe that –

Endless belts are fitted and correctly adjusted on finishing machines in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedure for fitting and adjusting endless belts on finishing machines can be given. The tools and techniques required to fit and adjust endless belts can be identified.

Criteria 8.10A.2.2

Grinding wheels and mops fitted and dressed according to standard operating procedure.

Assessor guide: observe that –

Grinding wheels and mops are fitted and dressed on pedestal grinders in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for fitting and dressing grinding wheels and mops can be given. The tools and techniques required to fit and dress grinding wheels and mops can be identified.

Criteria 8.10A.2.3

Polishing mops installed and set up according to standard operating procedure.

Assessor guide: observe that –

Polishing mops are installed and set up in polishing machines in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for installing and setting up polishing mops can be given. The tools and techniques required to install and set up polishing mops can be identified.

Element 8.10A.3 Identify job materials**Criteria 8.10A.3.1**

Common metals, alloys and non-metals recognised.

Assessor guide: observe that –

Assessor guide: confirm that –

Common metals, alloys and non-metals can be identified from given material samples. The appropriate polishing media to be used in finishing/polishing different types of material can be identified. The reasons for using different polishing media on different materials can be given. The effect of different types and grades of polishing media on the surface finish achieved can be explained.

Element 8.10A.4 Identify job surface condition**Criteria 8.10A.4.1**

Common surface imperfections recognised.

Assessor guide: observe that –

Assessor guide: confirm that –

Common surface imperfections/defects can be identified. Those surface imperfections/defects that can be removed/repared by manual finishing/polishing procedures can be identified. The procedures for handling components with surface imperfections/defects that cannot be removed/repared can be given.

Element 8.10A.5 Assess processing hazards associated with workpiece size and shape**Criteria 8.10A.5.1**

Hazards correctly identified.

Assessor guide: observe that –

Assessor guide: confirm that –

The hazards associated with the manual finishing/polishing process can be identified. The appropriate personal protective clothing and equipment can be identified.

Criteria 8.10A.5.2

Correct safe working procedures followed.

Assessor guide: observe that –

All work is carried out safely in accordance with safety and standard operating procedures.

Assessor guide: confirm that –

The relevant safety procedures can be identified.

Element 8.10A.6 Grind, finish, brush and/or polish job**Criteria 8.10A.6.1**

Job surface finished to specification using standard operating procedures.

Assessor guide: observe that –

The most appropriate surface finishing/polishing method and medium is used to finish the surface to specification in accordance with standard operating procedures.

Assessor guide: confirm that –

The appropriate polishing medium for the work to be undertaken can be identified. The procedures for finishing the work to specification can be given. The specification of the surface to be finished can be identified.

Range statement

Applies to finishing work made from a variety of materials, including cast iron, steel, zinc and its alloys, copper, aluminium and its alloys, bronzes, sterling silver, gold and plastics. Equipment used includes endless belt grinders, table finishers, pedestal grinders and polishers, felt wheels, fabric mops and brushes, with underhand and overhand techniques and flexible drive appliances. The variety of media employed includes solid and liquid compositions containing alumina, silicon carbide, diamond dust, tripoli, calcium oxide and iron oxides. This unit is not intended to apply in situations where touch-up finishing related to maintenance or assembly activities is undertaken.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the manual finishing/polishing of materials or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 8.11A A Undertake surface preparation using solvents and/or mechanical means

Band – Specialisation band A

Field – Surface finishing

Unit Weight 2

Pre-requisite units - Path 1

9.1A Draw and interpret sketch

13.3A Work safely with industrial chemicals and materials

18.1A Use hand tools

18.2A Use power tools/hand held operations

Element 8.11A.1 Determine job requirements

Criteria 8.11A.1.1

Work requirements determined from job sheet, instructions or other pre-determined specifications in accordance with standard operating procedures.

Assessor guide: observe that –

All relevant drawings, job sheets, specifications and instructions are obtained in accordance with work place procedures. Where appropriate, the surface/s to be prepared are inspected by the individual in accordance with work place procedures.

Assessor guide: confirm that –

The work to be undertaken can be identified. The specifications applying to the work can be identified and understood.

Criteria 8.11A.1.2

Where required, appropriate solvent and solvent application selected to meet job specification.

Assessor guide: observe that –

Correct solvent and application process determined from job specifications/instructions.

Assessor guide: confirm that –

A variety of surface conditions for which solvents are appropriate can be identified. The solvent/s appropriate to given conditions can be identified. The reasons for selecting the chosen solvents can be explained.

Criteria 8.11A.1.3

Where required, appropriate mechanical equipment selected to meet job specification.

Assessor guide: observe that –

Correct mechanical equipment for cleaning the job surface is selected.

Assessor guide: confirm that –

Appropriate mechanical equipment required for surface preparation to meet job specification can be identified.

Criteria 8.11A.1.4

Work site prepared for surface cleaning activities.

Assessor guide: observe that –

Site is prepared with due regard to OH&S requirements including site safety, clear working space, other materials/structures/personnel in the vicinity, isolation of work site where required.

Assessor guide: confirm that –

Safety issues can be clearly identified and explained, adequate precautions determined and identified, awareness of other site factors that could be affected by the work.

Element 8.11A.2 Set up equipment**Criteria 8.11A.2.1**

Appropriate equipment and any required consumables assembled, set up and prepared correctly and safely in accordance with manufacture's specifications and standard operating procedures.

Assessor guide: observe that –

Appropriate equipment is correctly set up in accordance with specifications and procedures. Any consumables are safely set up and prepared in accordance with specifications and procedures.

Assessor guide: confirm that –

The equipment for the selected method can be identified, assembled and set up as required. The set up procedures are clearly understood. All safety procedures are understood and applied.

Element 8.11A.3 Prepare surfaces using solvents as required**Criteria 8.11A.3.1**

Safe working environment for solvent use established according to regulatory requirements and standard operating procedures.

Assessor guide: observe that –

The work environment has been established to meet all safety requirements.

Assessor guide: confirm that –

The requirements for a safe working environment in which solvents are to be used can be identified. All relevant regulatory requirements are identified and understood.

Criteria 8.11A.3.2

Solvents applied correctly.

Assessor guide: observe that –

Solvents are used correctly and in accordance with manufacturer's specifications, safety requirements and standard operating procedures.

Assessor guide: confirm that –

The safety and operating procedures to be followed when using solvents to prepare surfaces can be identified. The specifications applying to the surface to be prepared can be identified, understood and applied.

Criteria 8.11A.3.3

Treated surface neutralised and made safe to handle.

Assessor guide: observe that –

The solvents used to prepare the surface are neutralised according to manufacture's specifications and standard operating procedures.

Assessor guide: confirm that –

The reasons and methods for neutralising solvents on completion of surface preparation can be identified and explained.

Element 8.11A.4 Prepare surfaces using mechanical means as required**Criteria 8.11A.4.1**

Safe working environment for mechanical surface preparation established according to regulatory requirements and standard operating procedures.

Assessor guide: observe that –

The work environment has been established to meet all safety requirements.

Assessor guide: confirm that –

The requirements for a safe working environment in which mechanical surface preparation means are to be used can be identified. All relevant regulatory requirements are identified and understood.

Criteria 8.11A.4.2

Surfaces prepared using mechanical means.

Assessor guide: observe that –

Mechanical equipment is used to prepare surface to specified standards in accordance with standard operating procedures.

Assessor guide: confirm that –

The safety and operating procedures to be followed when using mechanical equipment to prepare surfaces can be identified. The specifications applying to the surface to be prepared can be identified, understood and applied.

Criteria 8.11A.4.3

Mechanical equipment cleaned and checked for damage and operational faults, in accordance with standard operating procedures.

Assessor guide: observe that –

Mechanical equipment cleaned and checked in accordance with standard operating procedures. Operational faults identified, faults are recorded and reported in accordance with standard operating procedures. Equipment is stored in good condition in accordance with standard operating procedures.

Assessor guide: confirm that –

The standards procedures and manufacturer's specifications for cleaning, checking and storing mechanical equipment are understood.

Criteria 8.11A.4.4

Equipment faults recorded and reported in accordance with standard operating procedures.

Assessor guide: observe that –

Faults are recorded and reported to appropriate personnel in accordance with standard operating procedures.

Assessor guide: confirm that –

Standard procedures for recording and reporting faulty equipment are understood.

Element 8.11A.5 Inspect prepared surface**Criteria 8.11A.5.1**

Surface preparation assessed for cleanliness and conformance with specifications.

Assessor guide: observe that –

The surface condition is checked and inspected in accordance with standard operating procedures and against job specifications.

Assessor guide: confirm that –

The standard operating procedures and job specifications for checking prepared surfaces can be identified and understood.

Criteria 8.11A.5.2

Faults or defects rectified where required and inspection results recorded and reported in accordance with standard operating procedures.

Assessor guide: observe that –

All rectification work undertaken to meet job specifications and recording/reporting undertaken using standard operating procedures.

Assessor guide: confirm that –

Appropriate rectification techniques can be described. The recording/reporting procedures for job inspection can be identified and understood.

Range statement

Work is undertaken autonomously or as part of a team environment to established predetermined processes, practices and specifications including environmental requirements. Application of surface preparations can apply to metal and non-metal materials. Solvents refer to a range of cleaning chemicals including acids, hydrocarbons etc. The application of solvents may include spraying, wiping, brushing etc. Mechanical means/equipment includes the use of hand tools and hand held tools used for surface preparation work. All work and work practices undertaken to regulatory and legislative requirements.

Evidence guide

Assessment context

This unit should be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the preparation of surfaces using blasting processes and/or solvents or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 8.12A A Prepare surfaces by abrasive blasting (basic)

Band – Specialisation band A

Field – Surface finishing

Unit Weight 4

Pre-requisite units - Path 1

8.16A Control blast coating by-products, materials and emissions

13.3A Work safely with industrial chemicals and materials

Element 8.12A.1 Determine job requirements

Criteria 8.12A.1.1

Work requirements determined from job sheet, instructions or other pre-determined specifications in accordance with standard operating procedures.

Assessor guide: observe that –

All relevant drawings, job sheets, specifications and instructions are obtained in accordance with work place procedures. Where appropriate, the surface/s to be Prepared are inspected by the individual in accordance with work place procedures.

Assessor guide: confirm that –

The work to be undertaken can be identified. The specifications applying to the work can be identified and understood.

Criteria 8.12A.1.2

Appropriate abrasive blasting process, equipment and media identified to meet job specification.

Assessor guide: observe that –

Correct blasting equipment and media for cleaning the job surface is selected.

Assessor guide: confirm that –

Appropriate blasting equipment and media required for surface preparation to meet job specification can be identified.

Criteria 8.12A.1.3

Work site prepared for surface cleaning activities.

Assessor guide: observe that –

Site is prepared with due regard to OH&S requirements including site safety, clear working space, other materials/structures/personnel in the vicinity, isolation of work site where required.

Assessor guide: confirm that –

Safety issues can be clearly identified and explained, adequate precautions determined and identified, awareness of other site factors that could be affected by the work.

Element 8.12A.2 Set up equipment

Criteria 8.12A.2.1

Appropriate equipment and any required consumables assembled, set up and prepared correctly and safely in accordance with manufacture's specifications and standard operating procedures.

Assessor guide: observe that –

Appropriate equipment is correctly set up in accordance with specifications and procedures. Any consumables are safely set up and prepared in accordance with specifications and procedures.

Assessor guide: confirm that –

The equipment for the selected method can be identified, assembled and set up as required. The set up procedures are clearly understood. All safety procedures are understood and applied.

Criteria 8.12A.2.2

Correct rust inhibitor for use in wet abrasive blast methods is selected where required.

Assessor guide: observe that –

Rust inhibitor for use in wet abrasive blast methods is selected where required in accordance with standard operating procedures.

Assessor guide: confirm that –

The importance of using an appropriate rust inhibitor in wet blasting operations is understood and the selection procedures can be explained.

Criteria 8.12A.2.3

Pre operational checks are carried out on equipment and faults are rectified or reported for further action.

Assessor guide: observe that –

Pre operational checks are carried out in accordance with manufacturer's specifications and standard operating procedures.

Assessor guide: confirm that –

The method and process for undertaking pre operational checks can be identified and is understood.

Element 8.12A.3 Prepare surfaces using abrasive blasting

Criteria 8.12A.3.1

Blasting equipment is operated in accordance with standard operating procedures.

Assessor guide: observe that –

The surface is cleaned in accordance with standard operating procedures. Appropriate personal protective equipment is used correctly.

Assessor guide: confirm that –

The procedure for using abrasive blasting equipment can be identified. All relevant regulatory requirements are identified and understood.

Criteria 8.12A.3.2

Emergency shut down procedures can be undertaken.

Assessor guide: observe that –

Blasting equipment can be shut down in accordance with manufacturer's specifications, safety requirements and standard operating procedures.

Assessor guide: confirm that –

The safety and standard operating procedures to be followed when shutting down equipment can be identified and are understood.

Criteria 8.12A.3.3

Work procedures undertaken to appropriate environmental requirements.

Assessor guide: observe that –

Work activities performed in accordance with standard operating procedures and relevant environmental legislation/regulations.

Assessor guide: confirm that –

The relevant environmental legislation/regulations and requirements are understood as well as the use of appropriate operating procedures.

Criteria 8.12A.3.4

Abrasive media disposal carried out in accordance with standard operating procedures.

Assessor guide: observe that –

All abrasive media disposal in carried out in accordance with standard operating procedures.

Assessor guide: confirm that –

The standard operating procedures for abrasive media disposal can be identified and are understood.

Criteria 8.12A.3.5

Blasting equipment is cleaned and disassembled and inspected in accordance with manufacturer's specifications and standard operating procedures.

Assessor guide: observe that –

Blasting equipment cleaned and checked in accordance with standard operating procedures. Operational faults identified, faults are recorded and reported in accordance with standard operating procedures. Equipment is stored in good condition in accordance with standard operating procedures.

Assessor guide: confirm that –

The standards procedures and manufacturer's specifications for cleaning, checking and storing blasting equipment are understood.

Criteria 8.12A.3.6

Equipment faults are recorded and reported in accordance with standard operating procedures.

Assessor guide: observe that –

Faults are recorded and reported to appropriate personnel in accordance with standard operating procedures.

Assessor guide: confirm that –

Standard procedures for recording and reporting faulty equipment are understood.

Element 8.12A.4 Inspect prepared surface**Criteria 8.12A.4.1**

Surface preparation assessed for cleanliness and conformance with specifications.

Assessor guide: observe that –

The surface condition is checked and inspected in accordance with standard operating procedures and against job specifications.

Assessor guide: confirm that –

The standard operating procedures and job specifications for checking prepared surfaces can be identified and understood.

Criteria 8.12A.4.2

Faults or defects are rectified where required and inspection results recorded and reported in accordance with standard operating procedures.

Assessor guide: observe that –

All rectification work undertaken to meet job specifications and recording/reporting undertaken using standard operating procedures.

Assessor guide: confirm that –

Appropriate rectification techniques can be described. The recording/reporting procedures for job inspection can be identified and understood.

Range statement

This unit is designed to be used where a basic level of skill is desired in surface preparation by abrasive blasting. Equipment used includes but is not limited to electric and diesel compressors, blast pots, blast rooms, centrifugal blast machines, water pressure washers to 35,000 kpa, air hoses and nozzles, and specified hand and power tools. Routine maintenance tasks may include cleaning, lubricating, consumable replacements, and simple equipment repairs and adjustments using engineering principles, tools, equipment and procedures to statutory and regulatory requirements. Specific health and safety issues include noise, heat stress, compressed air, high pressure water, dust full body cover and particulate matter, hazardous materials and by-products. Personal protection equipment includes blast helmets, air respirators, eye protection, safety boots, and noise protection. The majority of work is in a team environment and uses predetermined procedures and standards for safety and quality with all work and work practices undertaken to regulatory and legislative requirements. Reference is made to supplier information and specifications as well as accepted and appropriate Australian and International Standards.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with surface cleaning or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 8.13A A Prepare surfaces by abrasive blasting (advanced)

Band – Specialisation band A

Field – Surface finishing

Unit Weight 4

Pre-requisite units - Path 1

8.12A Prepare surfaces by abrasive blasting (basic)

8.16A Control blast coating by-products, materials and emissions

13.3A Work safely with industrial chemicals and materials

Element 8.13A.1 Determine job requirements

Criteria 8.13A.1.1

Work requirements determined from job sheet, instructions or other specifications in accordance with standard operating procedures.

Assessor guide: observe that –

All relevant drawings, job sheets, specifications and instructions are obtained in accordance with work place procedures. Where appropriate, the surface(s) to be prepared are inspected by the individual in accordance with work place procedures.

Assessor guide: confirm that –

The work to be undertaken can be identified. The specifications applying to the work can be identified and understood.

Criteria 8.13A.1.2

Appropriate abrasive blasting process and equipment selected to meet job specification.

Assessor guide: observe that –

Correct blasting process and equipment for cleaning the job surface is selected.

Assessor guide: confirm that –

Appropriate blasting process and equipment required for surface preparation to meet job specification can be identified. Features of the various types of dry, vacuum automatic rotary, centrifugal and water blasting (including HP and UHP) can be described. Selection procedures for blast nozzles can be described.

Criteria 8.13A.1.3

Appropriate abrasive blasting media and equipment selected to meet job specification.

Assessor guide: observe that –

Correct blasting media for cleaning the job surface is selected.

Assessor guide: confirm that –

Appropriate blasting media required for surface preparation to meet job specification can be identified. Features of various types of blasting media can be described, including identification and comparison of size, shape, hardness, density, general composition and efficiency.

Criteria 8.13A.1.4

Work site prepared for surface cleaning activities.

Assessor guide: observe that –

Site is prepared with due regard to OH&S requirements including site safety, clear working space, other materials/structures/personnel in the vicinity, isolation of work site where required.

Assessor guide: confirm that –

Safety issues can be clearly identified and explained, adequate precautions determined and identified, awareness of other site factors that could be affected by the work.

Element 8.13A.2 Set up equipment**Criteria 8.13A.2.1**

Appropriate equipment and any required consumables assembled, set up and prepared correctly and safely in accordance with manufacture's specifications and standard operating procedures.

Assessor guide: observe that –

Appropriate equipment is correctly set up in accordance with specifications and procedures. Any consumables are safely set up and prepared in accordance with specifications and procedures. Appropriate media sample testing carried out and non-conformance rectified and reported where required and in accordance with specifications and procedures.

Assessor guide: confirm that –

The equipment for the selected method can be identified, assembled and set up as required. Correct pressures selected to suit blast nozzle, media and consumption differentials. The set up procedures are clearly understood. All safety procedures are understood and applied. Media sampling and testing procedures are identified and understood.

Criteria 8.13A.2.2

Correct rust inhibitor for use in wet abrasive blast methods is selected where required.

Assessor guide: observe that –

Rust inhibitor for use in wet abrasive blast methods is selected where required in accordance with standard operating procedures.

Assessor guide: confirm that –

The importance of using an appropriate rust inhibitor in wet blasting operations is understood and the selection procedures can be explained.

Criteria 8.13A.2.3

Pre operational checks are carried out on equipment and faults are rectified or reported for further action.

Assessor guide: observe that –

Pre operational checks are carried out in accordance with manufacturer's specifications and standard operating procedures.

Assessor guide: confirm that –

The method and process for undertaking pre operational checks can be identified and is understood.

Element 8.13A.3 Inspect surface prior to cleaning**Criteria 8.13A.3.1**

Inspect work piece prior to cleaning in accordance with standard operating procedure.

Assessor guide: observe that –

Work piece is inspected and any faults identified in accordance with standard operating procedures.

Assessor guide: confirm that –

The inspection procedure is identified and understood. Unsuitable work pieces can be determined in consideration of job specifications.

Criteria 8.13A.3.2

Identified faults/defects requiring remedial or pre treatment action are reported as required.

Assessor guide: observe that –

Identified faults/defects requiring remedial or pre treatment action are reported in accordance with standard operating procedures.

Assessor guide: confirm that –

Standard operating procedures for identifying faults/defects can be identified and are understood.

Element 8.13A.4 Prepare surfaces using abrasive blasting**Criteria 8.13A.4.1**

Blasting equipment is operated in accordance with standard operating procedures.

Assessor guide: observe that –

The surface is cleaned in accordance with standard operating procedures. Appropriate personal protective equipment is used correctly. Safe work practices are applied when working with compressed air.

Assessor guide: confirm that –

The procedure for using abrasive blasting equipment can be identified. All relevant regulatory requirements are identified and understood. Safe work practices when working with compressed air can be described.

Criteria 8.13A.4.2

Emergency shut down procedures can be carried out.

Assessor guide: observe that –

Blasting equipment can be shut down in accordance with manufacturer's specifications, safety requirements and standard operating procedures.

Assessor guide: confirm that –

The safety and standard operating procedures to be followed when shutting down equipment can be identified and are understood.

Criteria 8.13A.4.3

Work procedures undertaken to appropriate environmental requirements.

Assessor guide: observe that –

Work activities performed in accordance with standard operating procedures and relevant environmental legislation/regulations.

Assessor guide: confirm that –

The relevant environmental legislation/regulations and requirements are understood as well as the use of appropriate operating procedures.

Criteria 8.13A.4.4

Abrasive media disposal carried out in accordance with standard operating procedures.

Assessor guide: observe that –

All abrasive media disposal in carried out in accordance with standard operating procedures.

Assessor guide: confirm that –

The standard operating procedures for abrasive media disposal can be identified and are understood.

Criteria 8.13A.4.5

Blasting equipment is cleaned and disassembled and inspected in accordance with manufacturer's specifications and standard operating procedures.

Assessor guide: observe that –

Blasting equipment cleaned and checked in accordance with standard operating procedures. Operational faults identified, faults are recorded and reported in accordance with standard operating procedures. Equipment is stored in good condition in accordance with standard operating procedures.

Assessor guide: confirm that –

The standards procedures and manufacturer's specifications for cleaning, checking and storing blasting equipment are understood.

Criteria 8.13A.4.6

Equipment faults are recorded and reported in accordance with standard operating procedures.

Assessor guide: observe that –

Faults are recorded and reported to appropriate personnel in accordance with standard operating procedures.

Assessor guide: confirm that –

Standard procedures for recording and reporting faulty equipment are understood.

Element 8.13A.5 Inspect prepared surface**Criteria 8.13A.5.1**

Surface preparation assessed for cleanliness and conformance with specifications.

Assessor guide: observe that –

The surface condition is checked and inspected in accordance with standard operating procedures and against job specifications.

Assessor guide: confirm that –

The standard operating procedures and job specifications for checking prepared surfaces can be identified and understood.

Criteria 8.13A.5.2

Faults or defects are rectified where required and inspection results recorded and reported in accordance with standard operating procedures.

Assessor guide: observe that –

All rectification work undertaken to meet job specifications and recording/reporting undertaken using standard operating procedures.

Assessor guide: confirm that –

Appropriate rectification techniques can be described. The recording/reporting procedures for job inspection can be identified and understood.

Range statement

Work is undertaken autonomously or as part of a team environment using accepted standards for safety, quality and procedures. This unit is designed to be used where an advanced level of skill is desired in surface preparation using abrasive blasting. Media used includes, but is not limited to garnet, illmenite, slags, steel grit, steel shot, water, glass bead and soda. Specific environmental matters include noise, dust and particulate matter, run off, storm water and wastes. The operation and maintenance of compressed air systems and associated items, including emergency shut down procedures, is included. Reference is made to supplier information and specifications as well as accepted and appropriate Australian and International standards. All work and work practices undertaken to regulatory and legislative requirements.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with precision mechanical measurements or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied. A description of the steps/stages of workplace operations observed and the skills displayed in performing the workplace tasks and the processes understanding involved and described during the assessment. This includes a date record of achievements.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 8.14A A Apply protective coatings (basic)

Band – Specialisation band A

Field – Surface finishing

Unit Weight 4

Pre-requisite units - Path 1

8.16A Control blast coating by-products, materials and emissions

13.3A Work safely with industrial chemicals and materials

Element 8.14A.1 Determine job requirements

Criteria 8.14A.1.1

Work requirements determined from job sheet, instructions, drawings or visual inspection.

Assessor guide: observe that –

All relevant drawings, job sheets, specifications and instructions are obtained in accordance with workplace procedures.

Assessor guide: confirm that –

The work to be undertaken can be identified and specifications applying to the work can be identified and understood.

Criteria 8.14A.1.2

Required protective coating materials are identified according to job specification.

Assessor guide: observe that –

All relevant information and job requirements are considered.

Assessor guide: confirm that –

All relevant information is interpreted correctly.

Criteria 8.14A.1.3

Required protective coating application equipment identified according to job requirements.

Assessor guide: observe that –

All relevant information and job requirements are considered.

Assessor guide: confirm that –

All relevant information is interpreted correctly.

Criteria 8.14A.1.4

Work site prepared for application of protective coating.

Assessor guide: observe that –

Site is prepared with due regard to OH&S requirements including site safety, clear working space, other materials/structures/personnel in the vicinity, isolation of work site where required.

Assessor guide: confirm that –

Safety issues can be clearly identified and explained, adequate precautions determined and identified, awareness of other site factors that could be affected by the work.

Element 8.14A.2 Work piece prepared for application of protective coating

Criteria 8.14A.2.1

Surface condition inspected for readiness for application of protective coating according to specification.

Assessor guide: observe that –

Inspection is comprehensive and specifications are considered during inspection.

Assessor guide: confirm that –

Deviation from specified surface finish/condition can be identified.

Criteria 8.14A.2.2

Unsuitable work pieces/surfaces and fabrication defects are identified and appropriate remedial action or reporting undertaken in accordance with standard operating procedures.

Assessor guide: observe that –

Standard workplace procedures are used to identify, select and apply the appropriate treatment or actions to rectify items with surface or fabrication defects.

Assessor guide: confirm that –

Standard workplace procedures for identifying unsuitable work items can be followed and explained.

Criteria 8.14A.2.3

Components are masked where protective coating application is not specified.

Assessor guide: observe that –

Surface required as 'no paint areas' identified and protected using standard masking procedures and techniques.

Assessor guide: confirm that –

Method of locating areas to be protected from coating process and masked is understood.

Criteria 8.14A.2.4

Conditions for overspray identified.

Assessor guide: observe that –

Precautions undertaken to prevent overspray in the workplace using standard procedures.

Assessor guide: confirm that –

The areas subject to overspray and requiring protection can be identified and described.

Element 8.14A.3 Equipment prepared for application of surface coating materials

Criteria 8.14A.3.1

Required plant and equipment basic operations understood.

Assessor guide: observe that –

Assessor guide: confirm that –

Operation of plant and equipment using standard operating procedures is understood and can be described.

Criteria 8.14A.3.2

Routine maintenance is undertaken on plant and equipment in accordance with standard operating procedures.

Assessor guide: observe that –

Routine maintenance is undertaken on plant and equipment in accordance with standard operating procedures.

Assessor guide: confirm that –

Standard operating procedures for plant and equipment maintenance of plant and equipment can be identified and understood.

Criteria 8.14A.3.3

Status/reports recorded by proforma or orally in accordance with standard operating procedures.

Assessor guide: observe that –

All required maintenance records/reports are prepared and details communicated.

Assessor guide: confirm that –

The requirements for completion and processing of maintenance reports are understood.

Criteria 8.14A.3.4

Conventional coating application equipment assembled in accordance with equipment requirements and standard operating procedures.

Assessor guide: observe that –

Equipment is assembled in accordance with manufacturer's specifications and standard operating procedures.

Assessor guide: confirm that –

Assembly specifications and procedures are understood and can be described.

Element 8.14A.4 Apply single pack coatings**Criteria 8.14A.4.1**

Coating product type, solvent, uses, mixing procedure, clean up and safety requirements are identified as appropriate.

Assessor guide: observe that –

Coating type and appropriate solvents identified, standard workplace procedures required for mixing processes, clean-up and safe handling are identified.

Assessor guide: confirm that –

Workplace procedures for identifying coating types and processing solvents, mixing and safe handling practices are understood and can be described.

Criteria 8.14A.4.2

Correct method of determining wet film thickness in accordance with specified dry film is demonstrated.

Assessor guide: observe that –

Workplace procedures are used for determining the wet film thicknesses of a coating from the specified dry film thickness. Required thickness is calculated in accordance with product volume solids.

Assessor guide: confirm that –

The workplace procedures for determining the wet film thickness of a coating from the specified dry film thickness are understood. Calculations can be undertaken using a specified formulation.

Criteria 8.14A.4.3

Coating material is thinned to suit the application method and to achieve required film thickness.

Assessor guide: observe that –

Standard operating procedures are applied for thinning coating materials and the application of the specified film thickness coating to a substrate.

Assessor guide: confirm that –

Standard operating procedure for thinning coating materials for use in applying the specified film thickness coating to a substrate are understood.

Criteria 8.14A.4.4

Coating applied using specified application method and standard operating procedures.

Assessor guide: observe that –

Protective coating is applied to comply with an established standard using specified methods and standard operating procedures.

Assessor guide: confirm that –

Standard operating procedures to apply protective coatings to comply with an established standard are understood.

Criteria 8.14A.4.5

Coating application and curing technique monitored according to standard operating procedure.

Assessor guide: observe that –

Coating application and curing techniques are controlled using standard operating procedures.

Assessor guide: confirm that –

The procedures for controlling coating application and curing techniques are understood.

Element 8.14A.5 Clean and store equipment**Criteria 8.14A.5.1**

Conventional coating application equipment is cleaned, disassembled and inspected for damage.

Assessor guide: observe that –

Disassembly, cleaning and checking for functionality of spraying equipment and associated items is undertaken in accordance with standard operating procedures.

Assessor guide: confirm that –

Standard operating procedure for disassembly, cleaning and checking is understood.

Criteria 8.14A.5.2

Faulty equipment is recorded and reported to appropriate personnel in accordance with standard operating procedures.

Assessor guide: observe that –

Standard operating procedures are used to report on any damage or faulty parts and communication with appropriate personnel is undertaken.

Assessor guide: confirm that –

Standard operating procedures for recording and reporting defective parts are understood.

Criteria 8.14A.5.3

Coating application equipment is stored in accordance with standard operating procedures.

Assessor guide: observe that –

Procedure for storage is followed including any hazard reduction and/or protection of equipment and components.

Assessor guide: confirm that –

Standard operating procedures for storage and protection of equipment are understood and can be described.

Element 8.14A.6 Inspect finish surface**Criteria 8.14A.6.1**

Surface finish assessed for profile size differences and uses.

Assessor guide: observe that –

Surface condition of the work piece, including profile size properties and problems is checked according to standard operating procedures and other acceptable standards.

Assessor guide: confirm that –

The standard operating procedures and other relevant standards for assessing the profile of the surface finish are understood.

Criteria 8.14A.6.2

Coating thickness is determined using appropriate instruments and results compared with job specifications.

Assessor guide: observe that –

Thickness is determined using mechanical, electronic or other appropriate instruments. Test results compared with job specifications, drawings etc.

Assessor guide: confirm that –

Dry film thickness testing instruments can be identified and used.

Criteria 8.14A.6.3

Total surface inspected for conformance to specification in accordance with standard operating procedures.

Assessor guide: observe that –

Inspection is undertaken comprehensively as required by standard operating procedures.

Assessor guide: confirm that –

Standard operating procedures for surface inspection are understood, including the extent and detail of inspection as required.

Criteria 8.14A.6.4

Inspection results are recorded and reported in accordance with standard operating procedures.

Assessor guide: observe that –

All required inspection records/reports are prepared and details communicated.

Assessor guide: confirm that –

The requirements for completion and processing of inspection reports are understood.

Element 8.14A.7 Selected and maintain personal protective equipment (PPE)**Criteria 8.14A.7.1**

Appropriate personal protective equipment for coating application selected according to job requirements and standard operating procedures.

Assessor guide: observe that –

Personal protective equipment, suitable for applying protective coatings is selected.

Assessor guide: confirm that –

The standard procedure for identifying and selecting the required personal protective equipment is understood.

Criteria 8.14A.7.2

Personal protective equipment is used appropriately in accordance with manufacturer's specifications and standard operating procedures.

Assessor guide: observe that –

Appropriate personal protective equipment is used in workplace operations in accordance with standard procedures.

Assessor guide: confirm that –

The workplace standard procedure for the use of personal protective equipment is understood.

Criteria 8.14A.7.3

Ancillary support attachments identified and used.

Assessor guide: observe that –

Select the appropriate supports to use with personal protective equipment in standard operational practices.

Assessor guide: confirm that –

The use and selection of appropriate supports to use with personal protective equipment in standard operational practices is understood.

Criteria 8.14A.7.4

Personal protective equipment is maintained in accordance with manufacturer's specification and standard operating procedures.

Assessor guide: observe that –

Personal protective equipment items are checked for serviceability in accordance with manufacturer's specifications. Faulty items are recorded and reported using standard workplace procedures to appropriate personnel for remedial action.

Assessor guide: confirm that –

The standard procedures and manufacturer's specifications for inspecting and maintaining personal protective equipment in the workplace is understood.

Range statement

This unit is designed to be used where a basic level of skill is desired to spray single pack protective coatings not limited to brush, roller and conventional spray equipment. Work is undertaken autonomously or as part of a team environment using predetermined standards of safety, quality and operating procedures. Specific health and safety matters include interpretation of MSDS warnings, materials sensitivity, hazardous goods, breathable air and introduction of compressed air into the body. Personal protective equipment includes hand protection, full body protection, respirators, air fed hoods and foot protection. Noise and heat protection may also be necessary. Specific understanding is required of given supplier information and product details. Reference is made to supplier information and specifications as well as accepted and appropriate Australian and International standards. All work and work practices undertaken to regulatory and legislative requirements. Where required, unit 11.4A (Undertake dogging/crane chasing) and unit 11.10A (Operate mobile load shifting equipment) should also be selected.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with surface cleaning and coating or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 8.15A A Apply protective coatings (advanced)

Band – Specialisation band A

Field – Surface finishing

Unit Weight 4

Pre-requisite units - Path 1

8.14A Apply protective coatings (basic)

8.16A Control blast coating by-products, materials and emissions

13.3A Work safely with industrial chemicals and materials

Element 8.15A.1 Determine job requirements

Criteria 8.15A.1.1

Work requirements determined from job sheet, instructions or other specifications in accordance with standard operating procedures.

Assessor guide: observe that –

All relevant drawings, job sheets, specifications and instructions are obtained in accordance with work place procedures. Where appropriate, the surface(s) to be coated are inspected by the individual in accordance with work place procedures.

Assessor guide: confirm that –

The work to be undertaken can be identified. The specifications applying to the work can be identified and understood.

Criteria 8.15A.1.2

Appropriate coating system and material selected to meet job specification.

Assessor guide: observe that –

Correct coating system and material for the job surface and use is selected.

Assessor guide: confirm that –

Appropriate coating system and material required to meet job specification can be identified. Features of the various types of coating materials, including drying and curing requirements, can be described. Selection procedures for coating material can be described.

Criteria 8.15A.1.3

Appropriate coating process and equipment selected to meet job specification.

Assessor guide: observe that –

Correct coating process and equipment for applying the selected coating material is selected.

Assessor guide: confirm that –

Appropriate coating process and equipment required for surface coating to meet job specification can be identified. Application features of the various types of coating materials, methods, can be described. Selection procedures for coating process and equipment can be described, including conventional, airless and plural component.

Criteria 8.15A.1.4

Work site prepared for surface coating activities.

Assessor guide: observe that –

Site is prepared with due regard to OH&S requirements including site safety, clear working space, other materials/structures/personnel in the vicinity, isolation of work site where required.

Assessor guide: confirm that –

Safety issues can be clearly identified and explained, adequate precautions determined and identified, awareness of other site factors that could be affected by the work.

Element 8.15A.2 Work piece prepared for application of protective coating**Criteria 8.15A.2.1**

Surface condition inspected for readiness for application of protective coating according to specification.

Assessor guide: observe that –

Inspection is comprehensive and specifications are considered during inspection.

Assessor guide: confirm that –

Deviation from specified surface finish/condition can be identified.

Criteria 8.15A.2.2

Unsuitable work pieces/surfaces and fabrication defects are identified and appropriate remedial action or reporting undertaken in accordance with standard operating procedures.

Assessor guide: observe that –

Standard workplace procedures are used to identify, select and apply the appropriate treatment or actions to rectify items with surface or fabrication defects.

Assessor guide: confirm that –

Standard workplace procedures for identifying unsuitable work items can be followed and explained.

Criteria 8.15A.2.3

Components are masked where protective coating application is not specified.

Assessor guide: observe that –

Surfaces required as 'no paint areas' identified and protected using standard masking procedures and techniques.

Assessor guide: confirm that –

Method of locating areas to be protected from coating process and masked is understood.

Criteria 8.15A.2.4

Conditions for overspray identified.

Assessor guide: observe that –

Precautions undertaken to prevent overspray in the workplace using standard procedures.

Assessor guide: confirm that –

The areas subject to overspray and requiring protection can be identified and described.

Element 8.15A.3 Equipment prepared for application of surface coating materials

Criteria 8.15A.3.1

Required plant and equipment basic operations understood.

Assessor guide: observe that –

Assessor guide: confirm that –

Operation of plant and equipment using standard operating procedures is understood and can be described.

Criteria 8.15A.3.2

Routine maintenance is undertaken on plant and equipment in accordance with standard operating procedures.

Assessor guide: observe that –

Routine maintenance is undertaken on plant and equipment in accordance with standard operating procedures.

Assessor guide: confirm that –

Standard operating procedures for routine maintenance of plant end equipment can be identified and understood.

Criteria 8.15A.3.3

Status/reports recorded by proforma or orally in accordance with standard operating procedures.

Assessor guide: observe that –

All required maintenance records/reports are prepared and details communicated.

Assessor guide: confirm that –

The requirements for completion and processing maintenance reports are understood.

Criteria 8.15A.3.4

Coating application equipment assembled in accordance with equipment requirements and standard operating procedures.

Assessor guide: observe that –

Equipment is assembled in accordance with manufacturer's specifications and standard operating procedures.

Assessor guide: confirm that –

Assemble specifications and procedures are understood and can be described.

Criteria 8.15A.3.5

Personal protective equipment is selected and maintained in accordance with manufacturer's specifications and standard operating procedures.

Assessor guide: observe that –

Appropriate personal protective equipment is selected and maintained in accordance with job requirements, manufacturer's specifications, OH&S requirements and standard operating procedures.

Assessor guide: confirm that –

The procedure for selecting and maintaining personal protective equipment is identified and understood.

Element 8.15A.4 Apply coatings using conventional, airless and plural component equipment

Criteria 8.15A.4.1

Coating product type, solvent, uses, mixing procedure, clean up and safety requirements are identified as appropriate.

Assessor guide: observe that –

Work piece is inspected and any faults identified in accordance with standard operating procedures.

Assessor guide: confirm that –

The inspection procedure is identified and understood. Unsuitable work pieces can be determined in consideration of job specifications.

Criteria 8.15A.4.2

Correct method of determining wet film thickness in accordance with specified dry film is demonstrated.

Assessor guide: observe that –

Workplace procedures are used for determining the wet film thickness of a coating from the specified dry film thickness. Required thickness is calculated in accordance with product volume solids.

Assessor guide: confirm that –

The workplace procedures for determining wet film thickness of a coating from the specified dry film thickness are understood. Calculations can be undertaken using a specified formulation.

Criteria 8.15A.4.3

Coating material is thinned to suit the application to suit the application method and to achieve required film thickness.

Assessor guide: observe that –

Standard operating procedures are applied for thinning coating materials and the application of the specified film thickness coating to a substrate.

Assessor guide: confirm that –

Standard operating procedures for thinning coating materials for use in applying the specified film thickness coating to a substrate are understood.

Criteria 8.15A.4.4

Coating applied using specified application method and standard operating procedures.

Assessor guide: observe that –

Protective coating applied to comply with an established standard using specified methods and standard operating procedures.

Assessor guide: confirm that –

Standard operating procedures to apply protective coatings to comply with an established standard are understood.

Criteria 8.15A.4.5

Coating application and curing technique monitored according to standard operating procedure.

Assessor guide: observe that –

Coating application and curing techniques are controlled using standard operating procedures.

Assessor guide: confirm that –

The procedures for controlling coating application and curing techniques are understood.

Element 8.15A.5 Clean and store equipment**Criteria 8.15A.5.1**

Coating application equipment is cleaned, disassembled and inspected for damage.

Assessor guide: observe that –

Disassembly, cleaning and checking for functionality of spraying equipment and associated items is undertaken in accordance with standard operating procedures.

Assessor guide: confirm that –

Standard operating procedure for disassembly, cleaning and checking is understood.

Criteria 8.15A.5.2

Faulty equipment is recorded and reported to appropriate personnel in accordance with standard operating procedures.

Assessor guide: observe that –

Standard operating procedures are used to report on any damage or faulty parts and communication with appropriate personnel is undertaken.

Assessor guide: confirm that –

Standard operating procedures for recording and reporting defective parts are understood.

Criteria 8.15A.5.3

Coating application equipment is stored in accordance with standard operating procedures.

Assessor guide: observe that –

Procedure for storage is followed including any hazard reduction and/or protection of equipment and components.

Assessor guide: confirm that –

Standard operating procedures for storage and protection of equipment are understood and can be described.

Element 8.15A.6 Inspect finished surface**Criteria 8.15A.6.1**

Surface finish assessed for profile size differences and uses.

Assessor guide: observe that –

Surface condition of the work piece, including profile size properties and problems is checked according to standard operating procedures and other acceptable standards.

Assessor guide: confirm that –

The standard operating procedures and other relevant standards for assessing the profile of the surface finish are understood.

Criteria 8.15A.6.2

Coating thickness is determined using appropriate instruments and results compared with job specifications.

Assessor guide: observe that –

Thickness is determined using mechanical, electronic or other appropriate instruments. Test results compared with job specifications, drawings etc.

Assessor guide: confirm that –

Dry film thickness testing instruments can be identified and used.

Criteria 8.15A.6.3

Total surface inspected for conformance to specification in accordance with standard operating procedures.

Assessor guide: observe that –

Inspection is undertaken comprehensively as required by standard operating procedures.

Assessor guide: confirm that –

Standard operating procedures for surface inspection are understood, including the extent and detail of inspection as required.

Criteria 8.15A.6.4

Inspection results are recorded and reported in accordance with standard operating procedures.

Assessor guide: observe that –

All required inspection records/reports are prepared and details communicated.

Assessor guide: confirm that –

The requirements for completion and processing of inspection reports are understood.

Element 8.15A.7 Calculate, estimate and cost application of protective coating**Criteria 8.15A.7.1**

Surface area of work piece, materials, labour and equipment assessed.

Assessor guide: observe that –

Appropriate inspection and assessment methods used.

Assessor guide: confirm that –

The standard methods and procedures for determining surface area of various shapes of materials are understood and can be described.

Criteria 8.15A.7.2

Cost of materials, labour, handling and equipment determined.

Assessor guide: observe that –

Calculations are undertaken in accordance with standard operating procedures and specifications.

Assessor guide: confirm that –

The standard procedures for calculating costs are identified and understood.

Criteria 8.15A.7.3

Results recorded and reported as an estimate for the application of a protective coating system.

Assessor guide: observe that –

Calculated costs are recorded and reported in accordance with standard operating procedures.

Assessor guide: confirm that –

The standard operating procedures for recording and reporting calculated costs are identified and understood.

Range statement

Work is undertaken autonomously or as part of a team environment using accepted standards for safety, quality and procedures. This unit is designed to be used where an advanced level of skill is desired in all types of spray application protective coatings (including conventional, two pack, plural component). It includes inspection and interpretation of the results using all current industry knowledge and equipment. Test equipment included but not limited to Holiday and Pin Hole testing, wet and dry film thickness gauges, temperature, relative humidity and dew point, hardness, gloss, adhesion and cure testing and soluble salts. Reference is made to supplier information and specifications as well as accepted and appropriate Australian and International standards. All work and work practices undertaken to regulatory and legislative requirements.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with precision mechanical measurements or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied. A description of the steps/stages of workplace operations observed and the skills displayed in performing the workplace tasks and the process understanding involved and described during the assessment. This includes a date record of achievements.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 8.16A A Control blast coating by-products, materials and emissions

Band – Specialisation band A

Field – Surface finishing

Unit Weight 1

Pre-requisite units - Path 1

13.3A Work safely with industrial chemicals and materials

Element 8.16A.1 Apply specific health and safety matters in surface preparation

Criteria 8.16A.1.1

Products, hazardous materials and processes used in blaster cleaning and coating operations can be identified.

Assessor guide: observe that –

Assessor guide: confirm that –

The products, hazardous materials and processes associated with surface preparation and protective coating application can be described. The by-products, materials and emissions created by the blasting and coating process including associated hazards can be described.

Criteria 8.16A.1.2

Ensure appropriate safety procedures are applied.

Assessor guide: observe that –

Control the emissions and by-products relative to the worksite by using the appropriate standard safety procedures for the worksite and the blasting industry.

Assessor guide: confirm that –

Understanding the requirements of safety procedures to be observed when handling, controlling and transporting the by-products.

Criteria 8.16A.1.3

Unsafe working conditions are identified and reported to appropriate personnel.

Assessor guide: observe that –

The workplace's standard operating procedure for reporting unsafe working conditions to appropriate personnel is applied.

Assessor guide: confirm that –

The standard procedure for reporting unsafe working conditions associated with the control of by-products can be identified and understood.

Element 8.16A.2 Control by-products, materials and emissions

Criteria 8.16A.2.1

By-products, materials and emissions are contained using established procedures.

Assessor guide: observe that –

Samples of the by-products are collected as well as the method of storage and eventual removal from site to an appropriate waste treatment facility using standard operating procedures.

Assessor guide: confirm that –

The established procedures for collecting samples and containing workplace by-products and emissions can be identified and understood.

Criteria 8.16A.2.2

By-products, materials and emissions are monitored and directed to appropriate treatment or storage area.

Assessor guide: observe that –

By-product and emissions monitoring and transfer to the specific treatment and storage area is undertaken in accordance with standard operating procedures.

Assessor guide: confirm that –

The by-product collection equipment operation methods and the standard operating procedures for their disposal are understood.

Criteria 8.16A.2.3

Monitoring devices are checked for correct/continuous operation.

Assessor guide: observe that –

The checking of monitoring devices for correct equipment operation is carried out in accordance with manufacturers and standard operating procedures to ensure their continued operation.

Assessor guide: confirm that –

The manufacturer's operational standards for workplace waste control monitoring equipment and procedures for maintenance, identification of malfunction and/or operational wear can be identified and understood.

Criteria 8.16A.2.4

Status/reports recorded and reported.

Assessor guide: observe that –

Monitoring devices checking reports are recorded and reported in accordance with standard operating procedures.

Assessor guide: confirm that –

Procedures for recording and reporting are identified and understood.

Element 8.16A.3 By-product, materials and emissions disposed

Criteria 8.16A.3.1

Waste treatment processes applied in accordance with standard operating procedures.

Assessor guide: observe that –

The waste treatment process is implemented to meet statutory authorities regulations in accordance with standard operating procedures.

Assessor guide: confirm that –

The waste treatment process can be identified and understood.

Criteria 8.16A.3.2

Treatment processes are carried out in accordance with standard operating procedures and to meet authority requirements with regards to waste.

Assessor guide: observe that –

Recording and reporting of all results of waste treatment processes undertaken to standard operating procedures.

Assessor guide: confirm that –

The requirements for accurately recording and reporting are understood and can be described.

Range statement

This unit applies to the identification, evaluation and control of blaster coating by-products, materials and emissions. Work is undertaken autonomously or as part of a team environment using accepted standards for safety, quality and procedures. It includes common containment practices and regulatory waste removal processes, documentation and implementation etc. Reference is made to supplier information and specifications as well as accepted and appropriate Australian and International standards. All work and work practices undertaken to regulatory and legislative requirements.

Evidence guide**Assessment context**

This unit should be assessed on the job. The competencies covered by this unit would be demonstrated by an individual alone or as part of a team. Assessment should be conducted in the individual's own work environment.

Assessment conditions

Present evidence of credit for any off-the job training related to this unit. All tools, equipment, materials and documentation required; All safety clothing and personal safety equipment. The trainee will be permitted to refer to the following documents: Any relevant workplace procedures; any relevant product and manufacturing specifications. The trainee will be required to orally or by other methods of communication: Answer all questions put by the assessor; perform the tasks described by this guide; within a time frame established between the students supervisor/instructor and the assessor prior to taking this assessment; identify colleagues who can be approached for the collection of evidence where appropriate.

Critical aspects

This unit could be assessed in conjunction with any other units involved in the workplace training which address safety, quality, communication, recording and reporting associated with the control of by-products materials and emissions produced by the blaster coater industry or other units requiring exercise of the skills and knowledge covered by this unit.

Special notes

During assessment, the individual will:- Demonstrate safe working practices at all times; communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; take responsibility for the quality of their own work; plan tasks in all situations and review task requirements as appropriate; perform all tasks in accordance with standard operating procedures; perform all tasks to specifications.

Unit MEM 8.18A A Electroplate engineering coatings

Band – Specialisation band A

Field – Surface finishing

Unit Weight 6

This unit covers the competencies required to apply engineering metallic/ceramic coatings to ferrous and non-ferrous metals and some non-metallic materials eg plastics.

Processes may include electroplating, electroforming, electroless plating. Coatings may include standard hard chroming, heavy nickel, electroless nickel, nickel composites, heavy deposits of nickel, copper, bronze up to 10mm. Straightforward operation/monitoring of electroplating processes, is covered by Unit 8.3A (Perform electroplating operations).

Pre-requisite units - Path 1

7.1A Operational maintenance of machines/equipment	8.1A Wire, jig and barrel load/unload work	8.3A Perform electroplating operations
13.3A Work safely with industrial chemicals and materials	18.1A Use hand tools	

Element 8.18A.1 Select treatments and processes/equipment for producing engineering finishes

Criteria 8.18A.1.1

Appropriate treatment processes are selected according to base metal type, surface condition and relevant job specifications

Assessor guide: observe that –

Material condition is assessed and suitability for plating is determined

Assessor guide: confirm that –

Base materials can be identified including cast iron, brass, steels with machine welded sections Effect of plating process on different materials can be given Effects of conditions that affect engineering finishes, such as porosity, hardness, corrosion, protective films, surface finish of untreated material can be given
Specialised pre-treatment processes relating to base material type, plating process used and engineering finishes can be given

Criteria 8.18A.1.2

Process parameters are selected to achieve required coating

Assessor guide: observe that –

Process parameters are calculated/determined for given task
Current densities are determined/ selected

Assessor guide: confirm that –

Process parameters for current density, temp, agitation rate where necessary, dwell times, etching times, strike times/currents, deposition rate/time can be given Surface areas calculated to apply correct current Requirements for de-embrittlement can be given Specific surface finishes are related to post machining/grinding allowances and other requirements Standards operating procedure, work instructions for pre/post treatments/processes are understood

Criteria 8.18A.1.3

Appropriate equipment is selected

Assessor guide: observe that –

Equipment is selected based on product configuration, product requirements and specifications

Assessor guide: confirm that –

Application of different types of equipment to the type of work processed can be given

Element 8.18A.2 Prepare work for engineering finishes**Criteria 8.18A.2.1**

Products are correctly masked (stopped off) for selective plating

Assessor guide: observe that –

Areas for masking are identified from drawings/instructions
Correct masking materials are selected Products are masked correctly and excess materials removed from area to be plated Masking is continuous i.e. no gaps/ holidays/ porosity/completely covers areas to be excluded from plating process

Assessor guide: confirm that –

Masking materials can be given including wax, lacquers, tapes, foils Masking techniques/ application of materials can be given

Criteria 8.18A.2.2

Where applicable, conforming anodes are constructed and fitted correctly

Assessor guide: observe that –

Anode correctly sized for given job Correct materials used and sufficient current carrying capacity Anode positioned correctly and secured

Assessor guide: confirm that –

Principles of current distribution and role of conforming/ auxiliary anodes can be given Methods of constructing/fabricating and fitting anodes can be given Current capacity of conforming/auxiliary anodes can be given

Criteria 8.18A.2.3

Where applicable shields and robbers are constructed and fitted

Assessor guide: observe that –

Shields and robbers sized correctly Appropriate materials used for given job Shields/robbers positioned/secured correctly

Assessor guide: confirm that –

Principles of current distribution and role of shields and robbers can be given Materials used to construct shields robbers and their properties, applications can be identified Methods for constructing/fabricating can be given Methods of attachment and positioning of shields/robbers in relation to workpiece, to achieve desired current distribution can be given

Criteria 8.18A.2.4

Pre-treatment processes are carried out, where applicable

Assessor guide: observe that –

Mechanical/chemical pre-treatment carried out as appropriate

Assessor guide: confirm that –

Appropriate mechanical/chemical pre-treatment processes can be given

Element 8.18A.3 Monitor and control operating conditions and processes for engineering coatings**Criteria 8.18A.3.1**

Operating parameters are set to produce required surface conditions/specifications

Assessor guide: observe that –

Dwell, etch and plating times are set correctly
Voltages/currents are set correctly for electrolytic operations Solution maintenance requirements are identified
Temperatures are maintained

Assessor guide: confirm that –

Appropriate current densities for etching, striking and plating can be given Surface areas can be calculated and required current computed Solutions can be analysed/tested using simple test including density, titration, pH Additions required to adjust solutions to required strength can be computed Acceptable temperature ranges can be given

Criteria 8.18A.3.2

Surface conditions of finished components are monitored and confirmed and abnormalities identified

Assessor guide: observe that –

Adhesion confirmed, surface appearance checked for pores, inconsistency of plate, correct thickness, hardness and ductility

Assessor guide: confirm that –

Finish requirements and permissible tolerances can be given

Criteria 8.18A.3.3

Corrective actions are taken to rectify non-conforming conditions

Assessor guide: observe that –

Appropriate corrective action is taken including adjusting/solutions/times/reprocessing or additional processing

Assessor guide: confirm that –

Types of abnormalities, their causes and related corrective actions can be given

Element 8.18A.4 Maintain solutions for engineering finishes**Criteria 8.18A.4.1**

Solution compositions are checked and confirmed to specification/operating range

Assessor guide: observe that –

pH, density and titration readings are taken correctly. Solution concentrations are determined from titration test and/or laboratory reports

Assessor guide: confirm that –

The purpose and application of simple tests including pH, titration, density can be given. Solutions, solution compositions and operating ranges for processes relative to engineering coatings can be given, including cleaning/pre-treatment, electroplating and post treatment

Criteria 8.18A.4.2

Adjustment requirements/additions are determined

Assessor guide: observe that –

Required solution additions are calculated

Assessor guide: confirm that –

Calculations for additions/adjustments to solution are understood

Criteria 8.18A.4.3

Additions are made to adjust solution composition to correct operating range

Assessor guide: observe that –

Replenishment chemicals are added correctly. Relevant OH&S requirements are applied when handling chemicals and adding to baths.

Assessor guide: confirm that –

Safe working procedures for handling chemicals relative to engineering finishes and for safely adding to baths are understood. Effects of adding chemicals too quickly (e.g. overheating) can be explained. Procedures for measuring out materials can be given eg use of scales, volumetric measurement devices. Operating parameters of solutions can be given, including temperature, agitation rate and similar parameters

Range statement

This unit covers pre-treatment and application of engineering metallic/ceramic coatings to ferrous and non-ferrous metals and some non-metallic materials eg plastics. Coatings may include hard chroming, heavy nickel, electroless nickel, nickel composites, heavy deposits of nickel, copper, bronze up to 10mm. Application of engineering coatings may relate to wear resistance, corrosion protection, reclamation of worn components, manufacture of components (electroforming). Processes may include electroplating, electroforming, electroless plating. Operating parameters can include treatment times and currents, bath pH temperatures and densities, anode conditions, addition agent content, cleanliness of contacts etc., make-up, maintenance of solution levels and purity. Applicable knowledge of basic electrical principles, basic chemistry, basic electro chemistry, metallurgy, measurement, techniques for plating, impurities and imperfections, corrective actions, solutions and compositions for engineering finishes is included in this unit. Work is performed to established processes, practices, standard operating procedures and specifications. Work is carried out autonomously using pre-determined standards of quality and safety. OHS activities are undertaken to legislative requirements where applicable. All work is undertaken to accepted industry OH&S practices and to legislative requirements where applicable. For surface preparation operations Unit 8.11A (Undertake surface preparation using solvents and/or mechanical means and Unit 8.12A (Prepare surfaces by abrasive blasting (basic)) should be selected as appropriate. Straightforward operation of electroplating process is covered by Unit (8.3A Perform electroplating operations). Where pre-treatment operations only are carried out Unit 8.2A (Pre-treat work for subsequent surface coating) should be selected. For basic inspection of completed or partly completed products produced by others Unit 15.4 (Perform inspection (basic)) should be selected. Where dogging/lifting is undertaken, the appropriate materials handling units should be selected. For construction of anodes, shields/robbars etc, the appropriate fabrication units should be selected.

Evidence guide**Assessment context**

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with electroplating engineering coatings or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

Unit MEM 8.19A A Electroplate protective finishes

Band – Specialisation band A

Field – Surface finishing

Unit Weight 6

This unit covers the competencies required to apply protective finishes to a range of ferrous and non-ferrous materials using processes such as electroplating, electroforming, electroless plating. Typical protective finishes may include copper, nickel, zinc, tin. Straightforward operation/monitoring of electroplating processes, is covered by Unit 8.3A (Perform electroplating operations).

Pre-requisite units - Path 1

7.1A Operational maintenance of machines/equipment

8.1A Wire, jig and barrel load/unload work

8.3A Perform electroplating operations

13.3A Work safely with industrial chemicals and materials

18.1A Use hand tools

Element 8.19A.1 Select treatments and processes/equipment for producing protective finishes

Criteria 8.19A.1.1

Appropriate treatment processes are selected

Assessor guide: observe that –

Base material is identified and appropriate treatment processes are selected according to base metal type, surface condition and relevant job specifications. Material condition is assessed and suitability for plating is determined

Assessor guide: confirm that –

Different base materials and their properties are understood, including cold rolled steel, non ferrous metals. Effect of protective treatment process on different materials can be given. Effects of conditions that affect protective finishes can be given. Different pre-treatment processes and their application can be given. Pre-treatment processes can be related to surface condition of material e.g. heavy scale

Criteria 8.19A.1.2

Process parameters are selected to achieve required finish

Assessor guide: observe that –

Correct process parameters are selected. Current and processing time is calculated and set correctly. Relevant standard operating procedures/ specifications identified and interpreted

Assessor guide: confirm that –

Process parameters can be identified and related to each other, including current density, temperature, agitation rate, process (deposition) time. Differences between chromate conversion coatings can be given. Requirements for de-embrittlement can be given. Post treatment processes can be described. Procedures for pre/process/post treatments can be given

Criteria 8.19A.1.3

Appropriate equipment is selected

Assessor guide: observe that –

Equipment selection is based on product configuration, features, process/ production requirements and specifications

Assessor guide: confirm that –

Application of different equipment to the type of work processed can be given

Element 8.19A.2 Monitor and control protective finish processes and operating conditions**Criteria 8.19A.2.1**

Operating parameters are set to produce required protective finish/specifications

Assessor guide: observe that –

Dwell and plating times are correctly controlled
Appropriate current densities are applied to electrolytic operations Current is computed from surface area of work and current densities Temperatures are controlled within operating parameters Operation of thickness measuring equipment understood

Assessor guide: confirm that –

Process parameters and their meanings can be given, including dwell time, current density, current, temperature Current computations are understood Procedures for testing plate thickness can be given

Criteria 8.19A.2.2

Surface condition of finished components is monitored and confirmed and abnormalities identified

Assessor guide: observe that –

Acceptable appearance of work at each stage of process is known and confirmed at appropriate intervals Conformance to thickness specifications is monitored and confirmed as appropriate

Assessor guide: confirm that –

Acceptable appearances for each stage of operation can be given Different abnormalities can be given Thickness specifications can be given Requirements for chromate or other post treatments can be given

Criteria 8.19A.2.3

Corrective actions are taken to rectify non-conforming conditions

Assessor guide: observe that –

Corrective action taken as appropriate including adjusting/solutions/times/reprocessing or additional processing

Assessor guide: confirm that –

Types of defects, their causes and related corrective actions can be given

Criteria 8.19A.2.4

Pre-treatment processes are carried out, where applicable

Assessor guide: observe that –

Mechanical/chemical pre-treatment carried out as appropriate

Assessor guide: confirm that –

Appropriate mechanical/chemical pre-treatment processes can be given

Element 8.19A.3 Maintain solutions for protective finishes**Criteria 8.19A.3.1**

Solution compositions are checked and confirmed to specification/operating range

Assessor guide: observe that –

Concentration and pH is determined by simple testing procedures

Assessor guide: confirm that –

The purpose and application of simple tests incl pH and concentration can be given Solutions, solution compositions and operating ranges for processes relative to protective finishes can be given, including cleaning/pre-treatment, electroplating and post treatment

Criteria 8.19A.3.2

Adjustment requirements/additions identified

Assessor guide: observe that –

Required chemical/solution additions are correctly calculated Replenishment schedule for brighteners is applied correctly

Assessor guide: confirm that –

Calculations for additions/adjustments to solution are understood Use of replenishment schedule for brighteners is understood

Criteria 8.19A.3.3

Additions made to adjust solution composition to correct operating range

Assessor guide: observe that –

Replenishment chemicals are added correctly Relevant OH&S requirements are applied when handling chemicals and adding to baths

Assessor guide: confirm that –

Safe working procedures for handling chemicals relative to protective finishes and for safely adding to baths are understood Effects of adding chemicals too quickly (e.g. overheating) can be explained Procedures for measuring out materials can be given eg use of scales, volumetric measurement devices Operating parameters of solutions can be given, including temperature, agitation rate and similar parameters

Criteria 8.19A.3.4

Purification procedures are carried out as appropriate

Assessor guide: observe that –

Purification procedures appropriate to impurities/contamination undertaken

Assessor guide: confirm that –

Purification procedures for protective finish solutions are understood, including filtration, electrolytic treatments, chemical precipitation and zinc dust treatments Level of impurities and permissible limits can be given Effects of impurities can be explained

Criteria 8.19A.3.5

Anodes are maintained to ensure correct operation

Assessor guide: observe that –

Anode baskets/bags and anode materials are replaced, replenished and sufficient anode/ cathode ratio ensured Anode checked for satisfactory working condition

Assessor guide: confirm that –

Different anode arrangements incl use of baskets & bags, conforming anodes can be given Correct performance of anodes and operating conditions understood

Element 8.19A.4 Maintain equipment for protective finishes**Criteria 8.19A.4.1**

Performance of ancillary equipment is checked and remedial actions taken as necessary

Assessor guide: observe that –

Performance of various ancillary equipment is checked, including correct operation/ control of anodes Remedial action is taken according to standard operating procedures

Assessor guide: confirm that –

Correct operation of anodes and appropriate remedial action is understood Correct operation and cleaning requirements of cleaning filters is understood Performance requirements and basic maintenance checks for rectifier, bus bars, agitation, heating/cooling, extraction and tank linings understood Effect of maintenance schedules on plant performance can be given

Criteria 8.19A.4.2

Electrical contacts are maintained

Assessor guide: observe that –

Condition of electrical contacts is checked and correct operation confirmed Corrective action is taken to rectify faults

Assessor guide: confirm that –

Methods for detecting unsatisfactory contact are understood eg heat, fluctuating current readings Importance of maintaining satisfactory electrical contact can be explained

Criteria 8.19A.4.3

Process transfer equipment is maintained

Assessor guide: observe that –

Condition of racks, jigs & barrels checked Build up on cathode contacts stripped as required and equipment maintained in serviceable condition . Condition of rack coating is monitored and racks placed out of service for recoating as per standard operating procedure

Assessor guide: confirm that –

Effects of build up on cathode contacts and damage to rack coatings can be given

Range statement

This unit covers pre-treatment and application of protective finishes to a range of ferrous and non-ferrous materials using processes such as electroplating, electroforming, electroless plating. Typical protective finishes may include copper, nickel, zinc, tin. Typical applications would include wear resistance, corrosion protection, reclamation of worn components, manufacture of components (electroforming). Processing may apply to manual, semi or fully automatic still or barrel plating environments and may include volume production and "one-off" components. Operating parameters can include calculation and setting of treatment times and currents, bath pH, temperatures and densities, solution levels and compositions, purification procedures. Maintenance of solutions includes typical tests for pH and concentration, calculation of adjustments to relevant solutions. Maintenance of process equipment includes anode condition, electrical contacts etc. Use of plating techniques, solutions and compositions for protective finishes, recognition and assessment of impurities and imperfections and associated corrective actions are integral to all applications. Basic principles of chemistry, electro chemistry and metallurgy apply to this level of work as part of this unit. Work undertaken autonomously or in a team environment using predetermined standards of quality, safety. All work is undertaken to accepted industry OH&S practices and to legislative requirements where applicable. For surface preparation operations Unit 8.11A (Undertake surface preparation using solvents and/or mechanical means) and Unit 8.12A (Prepare surfaces by abrasive blasting (basic)) should be selected as appropriate. Straightforward operation of electroplating process is covered by Unit (8.3A Perform electroplating operations). Where pre-treatment operations only are carried out Unit 8.2A (Pre-treat work for subsequent surface coating) should be selected. For basic inspection of completed or partly completed products produced by others Unit 15.4 (Perform inspection (basic)) should be selected. Where dogging/lifting is undertaken, the appropriate units materials handling units should be selected. For construction of anodes, shields/robbars etc, the appropriate fabrication units should be selected.

Evidence guide**Assessment context**

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with electroplating protective finishes or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

Unit MEM 8.20A A Electroplate decorative finishes

Band – Specialisation band A

Field – Surface finishing

Unit Weight 6

This unit covers the competencies required to apply decorative finishes to a range of ferrous and non-ferrous materials using processes such as electroplating, electroforming, electroless plating. Typical decorative finishes may include copper, nickel, zinc, tin. Straightforward operation/monitoring of electroplating processes, is covered by Unit 8.3A (Perform electroplating operations).

Pre-requisite units - Path 1

7.1A Operational maintenance of machines/equipment	8.1A Wire, jig and barrel load/unload work	8.3A Perform electroplating operations
13.3A Work safely with industrial chemicals and materials	18.1A Use hand tools	

Element 8.20A.1 Select treatments and processes/equipment for producing protective finishes

Criteria 8.20A.1.1

Appropriate treatment processes are selected according to base metal type, surface condition and relevant job specifications

Assessor guide: observe that –

Base metal is identified, condition is assessed and suitability for plating is determined Pretreatment selected according to base metal type, surface condition and relevant job specifications

Assessor guide: confirm that –

Specific pre-treatments for common base metals and soils can be given, including degreasing, soak/cleaning, electrolytic cleaning, activating dips Pre-treatment processes can be related to surface condition of material Different base metals and their properties are understood Effect of decorative treatment process on different metals can be given Effects of conditions that affect decorative finishes can be given

Criteria 8.20A.1.2

Mass treatment processes are selected and carried out, where applicable

Assessor guide: observe that –

Surface condition assessed suitable for plating Appropriate mass treatment process selected Treatment operation carried out correctly

Assessor guide: confirm that –

Different mechanical pretreatment processes are understood

Criteria 8.20A.1.3

Pre-plating treatments identified

Assessor guide: observe that –

The need for strikes/activation treatment is identified Need for copper undercoat or equivalent is identified

Assessor guide: confirm that –

The functions of strikes/activation treatment can be given Copper or equivalent pre-plate processes can be identified for specific base metals

Criteria 8.20A.1.4

Process parameters are selected to achieve required coating

Assessor guide: observe that –

Correct process parameters are selected. Current and processing time is calculated and set correctly. Relevant standard operating procedures/ specifications performance requirement of finish identified and interpreted Plating sequence is selected to achieve desired specification and/or service requirements of the finish

Assessor guide: confirm that –

Process parameters can be identified and related to each other, including current density, temperature, agitation rate, process (deposition) time Post treatment processes can be described Procedures for pre/process/post treatments can be given Applicable Australian Standards covering selection of type, coatings and thickness requirements for interior and external service conditions can be given

Criteria 8.20A.1.5

Appropriate equipment is selected

Assessor guide: observe that –

Equipment selection is based on product configuration, features, process/ production requirements and specifications

Assessor guide: confirm that –

Application of different equipment to the type of work processed can be given

Element 8.20A.2 Monitor and control decorative finish processes and operating conditions

Criteria 8.20A.2.1

Operating parameters are set to produce required decorative finish/specifications

Assessor guide: observe that –

Appropriate current densities are applied Current is computed from surface area of work and current densities Temperatures and agitation are controlled within operating parameters

Assessor guide: confirm that –

Process parameters and their meanings can be given, including , current density, voltage, temperature and agitation Current computations are understood Effects of parameters on performance understood

Criteria 8.20A.2.2

Plate appearance and final finish is monitored and confirmed and abnormalities identified

Assessor guide: observe that –

Plate appearance is monitored and confirmed at each plating stage Acceptable appearance of work at each stage of process is known and confirmed at appropriate intervals Conformance to specifications/customer requirements is monitored and confirmed as appropriate

Assessor guide: confirm that –

Acceptable appearances for each stage of operation and for final specification/quality can be given. Different abnormalities associated with decorative plating and their causes can be given including poor/uneven brightness/texture, inadequate levelling, roughness, pitting, poor adhesion, blistering, burning poor plate coverage (particularly chromium), incorrect colour (particularly flash brass, gold) Thickness specifications can be given Requirements for post treatments can be given

Criteria 8.20A.2.3

Corrective actions are taken to rectify non-conforming conditions

Assessor guide: observe that –

Corrective action taken as appropriate including adjusting/solutions/times/reprocessing or additional processing

Assessor guide: confirm that –

Types of defects, their causes and related corrective actions can be given

Criteria 8.20A.2.4

Pre-treatment processes are carried out, where applicable

Assessor guide: observe that –

Mechanical/chemical pre-treatment carried out as appropriate.

Assessor guide: confirm that –

Appropriate mechanical/chemical pre-treatment processes can be given.

Criteria 8.20A.2.5

Racks, jigs and barrels checked for correct loading

Assessor guide: observe that –

Correct loading of racks, jigs and barrels is determined according to conditions and factors affecting plate distribution

Assessor guide: confirm that –

Factors affecting plate distribution are understood Suitability of racks/jigs can be related to different conditions

Element 8.20A.3 Maintain solutions for decorative finishes**Criteria 8.20A.3.1**

Solution compositions are checked and confirmed to specification/operating range

Assessor guide: observe that –

PH, temperature and titration is determined by simple testing procedures

Assessor guide: confirm that –

The purpose and application of simple control tests including PH, temperature and titration can be given Solutions, solution compositions and operating ranges for processes relative to decorative finishes can be given, including cleaning/pre-treatment, plating and post treatment

Criteria 8.20A.3.2

Adjustment requirements/additions identified

Assessor guide: observe that –

Test results are interpreted correctly Required chemical/solution additions are correctly calculated Replenishment schedule for brighteners/additives is applied correctly

Assessor guide: confirm that –

Calculations for additions/adjustments to solution are understood Use of replenishment schedule for brighteners/additives is understood

Criteria 8.20A.3.3

Additions made to adjust solution composition to correct operating range

Assessor guide: observe that –

Replenishment chemicals are added correctly. Relevant OH&S requirements are applied when handling chemicals and adding to baths.

Assessor guide: confirm that –

Safe working procedures for handling chemicals relative to decorative finishes and for safely adding to baths are understood Effects of adding chemicals too quickly (e.g. overheating) can be explained Procedures for measuring out materials can be given eg use of scales, volumetric measurement devices Operating parameters of solutions can be given, including temperature, agitation rate and similar parameters

Criteria 8.20A.3.4

Purification procedures are carried out as appropriate

Assessor guide: observe that –

Purification procedures appropriate to impurities/contamination undertaken

Assessor guide: confirm that –

Purification procedures/treatments, plating out, carbon and chemical treatments for decorative finish solutions are understood Level of impurities and permissible limits can be given Effects of impurities can be given

Criteria 8.20A.3.5

Anodes are maintained to ensure correct operation

Assessor guide: observe that –

Anode baskets/bags and anode materials are replaced, replenished and sufficient anode/cathode ratio ensured. Anode checked for satisfactory working condition

Assessor guide: confirm that –

Different anode arrangements incl use of baskets & bags, conforming anodes can be given. Correct performance of anodes and operating conditions understood

Element 8.20A.4 Maintain equipment for decorative finishes**Criteria 8.20A.4.1**

Performance of ancillary equipment is checked and remedial actions taken as necessary

Assessor guide: observe that –

Performance of various equipment is checked, including correct operation/ control of anodes, operation of filtration equipment, rectifier, bus bars, agitation, heating/cooling, extraction and tank linings Remedial action is taken according to standard operating procedures

Assessor guide: confirm that –

Correct operation of anodes and appropriate remedial action is understood Correct operation and cleaning requirements of cleaning filters is understood Performance requirements and basic maintenance checks for rectifier, bus bars, agitation, heating/cooling, extraction and tank linings understood Effect of maintenance schedules on plant performance can be given

Criteria 8.20A.4.2

Electrical contacts are maintained

Assessor guide: observe that –

Condition of electrical contacts is checked and correct operation confirmed. Corrective action is taken to rectify faults.

Assessor guide: confirm that –

Methods for detecting unsatisfactory contact are understood eg heat, fluctuating current readings. Importance of maintaining satisfactory electrical contact can be explained

Criteria 8.20A.4.3

Process transfer equipment is maintained

Assessor guide: observe that –

Condition of racks, jigs & barrels checked. Build up on cathode contacts stripped as required and equipment maintained in serviceable condition. Condition of rack coating is monitored and racks placed out of service for recoating as per standard operating procedure

Assessor guide: confirm that –

Effects of build up on cathode contacts and damage to rack coatings can be given.

Range statement

This unit covers the application of decorative finishes to a range of ferrous and non-ferrous materials using processes such as electroplating, electroforming, electroless plating, electrophoretic coating. Typical decorative finishes would include nickel, chrome, copper, silver, gold and rhodium. Typical applications would include household fittings, hardware, artifacts and accessories. Processing may apply to manual, semi or fully automatic still or barrel plating environments and may include volume production and "one-off" components. Operating parameters can include calculation and setting of treatment times and currents, bath pH, temperatures and densities, solution levels and compositions, purification procedures. Maintenance of solutions includes typical tests for pH density and titration, calculation of adjustments to relevant solutions. Maintenance of process equipment includes anode condition, electrical contacts etc. Use of plating techniques, solutions and compositions for decorative finishes, recognition and assessment of impurities and imperfections and associated corrective actions are integral to all applications. Basic principles of chemistry, electro chemistry and metallurgy apply to this level of work. Work undertaken autonomously or in a team environment using predetermined standards of quality, safety. For pre-treatment operations Unit 8.11 Undertake surface preparation using solvents and/or mechanical means and/or Unit 8.12 Prepare surfaces by abrasive blasting (basic) should be selected. For basic inspection of completed or partly completed products produced by others unit 15.4 Perform inspection (basic) should be selected. All work is undertaken to accepted industry OH&S practices and to legislative requirements where applicable. Where dogging/lifting is undertaken, the appropriate units materials handling units should be selected. For construction of anodes, shields/robbars etc, the appropriate fabrication units should be selected. For straightforward operation/monitoring of electroplating processes, unit 8.3A Perform electroplating operations should be selected.

Evidence guide**Assessment context**

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with electroplating decorative finishes or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Special notes

Unit MEM 9.1A A Draw and interpret sketch

Band – Specialisation band A

Field – Drawing, drafting & design

Unit Weight 2

Element 9.1A.1 Prepare freehand sketch

Criteria 9.1A.1.1

Sketch correctly and appropriately drawn.

Assessor guide: observe that –

The sketch is correctly drawn with appropriate views where applicable.

Assessor guide: confirm that –

The object(s) to be sketched can be identified. The number of views necessary to convey all relevant information about the objects to be sketched can be identified.

Criteria 9.1A.1.2

Sketch depicts object or part.

Assessor guide: observe that –

The object is appropriately represented in the sketched view(s). Where appropriate, the objects represented in the sketch are correctly labelled and/or identified.

Assessor guide: confirm that –

Assessor guide: confirm that –

Criteria 9.1A.1.3

Dimensions obtained correctly.

Assessor guide: observe that –

The dimensions of the object are obtained correctly using appropriate measuring techniques/instruments. The units of measurement used in preparing the sketch are clearly identified.

The measuring techniques/instruments to be used to obtain the dimensions of the object can be identified. The reasons for selecting the chosen measuring techniques/instruments can be explained.

Criteria 9.1A.1.4

Dimensions shown clearly.

Assessor guide: observe that –

All necessary dimensions are shown clearly on the sketch.

Assessor guide: confirm that –

The key dimensions to be conveyed by the sketch can be identified.

Criteria 9.1A.1.5

Instructions shown clearly.

Assessor guide: observe that –

All necessary instructions/ information is conveyed by the appropriate use of notes in the sketch.

Assessor guide: confirm that –

The information/instructions to be conveyed by the sketch can be identified. Where appropriate, symbols to be used in the sketch and their purpose/meaning are identified.

Criteria 9.1A.1.6

Base line or datum point indicated.

Assessor guide: observe that –

Where appropriate, the base line, centre line and/or datum point for the object is clearly indicated on the sketch.

Assessor guide: confirm that –

The function of base lines, centre lines and datum points can be explained. The appropriate base line, centre line and/or datum point for the object being sketched can be identified.

Element 9.1A.2 Interpret details from freehand sketch**Criteria 9.1A.2.1**

Components, assemblies or objects recognised as required.

Assessor guide: observe that –

Assessor guide: confirm that –

Where appropriate, the relationship between the views contained in the sketch can be identified. The number of objects represented in the sketch can be identified. The objects represented in the sketch can be correctly identified.

Criteria 9.1A.2.2

Dimensions identified as appropriate to field of employment.

Assessor guide: observe that –

Assessor guide: confirm that –

The units of measurement used in the preparation of the sketch can be identified. The dimensions of the key features of the object(s) depicted in the sketch can be correctly identified.

Criteria 9.1A.2.3

Instructions identified and followed as required.

Assessor guide: observe that –

Assessor guide: confirm that –

The instructions contained in the sketch can be identified. The actions to be undertaken in response to those instructions can be given.

Criteria 9.1A.2.4

Material requirements identified as required.

Assessor guide: observe that –

Assessor guide: confirm that –

Where appropriate, the materials from which the object(s) are made can be identified from the sketch.

Criteria 9.1A.2.5

Symbols recognised as appropriate in sketch.

Assessor guide: observe that –

Assessor guide: confirm that –

Where appropriate, any symbols used in the sketch can be identified and correctly interpreted.

Range statement

Sketches may be applied to any of the full range of engineering disciplines. Sketches will consist of a single plane drawing with dimensions and specifications gained by hand measuring equipment. The level of symbol knowledge applied in this unit will be appropriate to the field and level of employment of the person interpreting the sketch. Where any drawing sketch, chart, diagram is only used as the technique for communication then this unit does not apply, see Unit 1.1F (Undertake interactive workplace communication).

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the drawing and interpretation of sketches or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 9.2A A Interpret technical drawing

Band – Specialisation band A

Field – Drawing, drafting & design

Unit Weight 4

Element 9.2A.1 Interpret technical drawing

Criteria 9.2A.1.1

Components, assemblies or objects recognised as required.

Assessor guide: observe that –

Assessor guide: confirm that –

The relationship between the views contained in the drawing can be identified. The number of objects/components contained in the drawing can be identified. The objects represented in the drawing can be correctly identified.

Criteria 9.2A.1.2

Dimensions identified as appropriate to field of employment.

Assessor guide: observe that –

Assessor guide: confirm that –

The units of measurement used in the preparation of the drawing can be identified. The dimensions of the key features of the objects depicted in the drawing can be correctly identified.

Criteria 9.2A.1.3

Instructions identified and followed as required.

Assessor guide: observe that –

Assessor guide: confirm that –

The instructions contained in the drawing can be identified. The actions to be undertaken in response to those instructions can be given.

Criteria 9.2A.1.4

Material requirements identified as required.

Assessor guide: observe that –

Assessor guide: confirm that –

The materials from which the object(s) are made can be identified from the drawing.

Criteria 9.2A.1.5

Symbols recognised as appropriate in drawing.

Assessor guide: observe that –

Assessor guide: confirm that –

Any symbols used in the drawing can be identified and interpreted correctly.

Element 9.2A.2 Select correct technical drawing**Criteria 9.2A.2.1**

Drawing checked and validated against job requirements or equipment.

Assessor guide: observe that –

The drawing is checked against job requirements/related equipment in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for checking and validating drawings against job requirements and/or the related equipment can be given. The reasons for validating the drawing against the job requirements and/or related equipment can be explained.

Criteria 9.2A.2.2

Drawing version checked and validated.

Assessor guide: observe that –

The drawing version is confirmed as being current in accordance with standard operating procedures. Where appropriate, the current version of the drawing is obtained in accordance with standard operating procedures.

Assessor guide: confirm that –

The version of the drawing can be identified. The source of information with respect to the current version of the drawing can be identified. The procedures for obtaining current versions of drawings can be given. The reasons for validating that the current version of the drawing is being used can be explained.

Range statement

Technical drawing interpretation is applied to any of the full range of engineering disciplines. Technical drawings may utilise perspective, exploded views or hidden view techniques. Drawings are provided to Australian Standard 1100 and/or Australian Standard 1102 and their equivalents from the full range of engineering disciplines. Standard symbols to Australian Standard 1100 and/or Australian Standard 1102 or equivalent as above, are recognised in field of employment. Technical drawings may include symbol glossaries. Where interpretation of any drawing sketch, chart, diagram is required and is provided at a lower level than Australian Standard 1100/Australian Standard 1102 or their equivalent then these skills are covered by Unit 9.1A (Draw and interpret sketch). Where any drawing sketch, chart, diagram is only used as the technique for communication then this unit does not apply, see Unit 1.1F (Undertake interactive workplace communication).

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the interpretation of technical drawings or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 9.3A A Prepare basic engineering drawing

Band – Specialisation band A

Field – Drawing, drafting & design

Unit Weight 8

Pre-requisite units - Path 1

9.2A Interpret technical drawing

Element 9.3A.1 Identify drawing requirements

Criteria 9.3A.1.1

Requirements and purpose of drawing determined from customer and/or work specification and associated documents.

Assessor guide: observe that –

All relevant job requirements and specifications are obtained in accordance with workplace procedures.

Assessor guide: confirm that –

The requirements and purpose of the drawing to be produced can be identified. The requirements and purpose of the engineering parts list can be identified.

Criteria 9.3A.1.2

Identify and collect all data necessary to produce the drawing.

Assessor guide: observe that –

All relevant data/information necessary to produce the drawing is obtained in accordance with workplace procedures.

Assessor guide: confirm that –

The data/information necessary to produce the drawing can be identified. The purpose(s) for which the data/information is to be obtained can be given. The sources of relevant data/ information can be identified.

Criteria 9.3A.1.3

Drawing requirements confirmed with relevant personnel and timeframes for completion established.

Assessor guide: observe that –

Assessor guide: confirm that –

The timeframe for completion of the drawing(s) can be given. The person(s) who can confirm drawing requirements can be identified.

Element 9.3A.2 Prepare or make changes to engineering drawing

Criteria 9.3A.2.1

Select drafting equipment appropriate to the drawing method chosen.

Assessor guide: observe that –

The drafting equipment used to produce the drawing is appropriate to the drawing method chosen.

Assessor guide: confirm that –

The method of drawing preparation can be identified. The reasons for selecting the chosen drawing method can be given. The drafting equipment necessary to prepare the drawing using the method chosen can be identified.

Criteria 9.3A.2.2

Apply drafting principles to produce a drawing that is consistent with standard operating procedures within the enterprise.

Assessor guide: observe that –

The drawing produced/changed is in conformance with the relevant standard.

Assessor guide: confirm that –

The procedures for producing an initial drawing can be given. The procedures for changing an existing drawing can be given. The drafting principles to be applied to the production/changing of a drawing can be given. The standards to which the drawing is to be produced can be identified.

Criteria 9.3A.2.3

Undertake all work safely and to prescribed procedure.

Assessor guide: observe that –

All work is undertaken safely and in accordance with workplace procedures.

Assessor guide: confirm that –

Criteria 9.3A.2.4

Completed drawing is approved in accordance with standard operating procedures.

Assessor guide: observe that –

The completed drawing is approved in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for checking and approving drawings can be given. The persons responsible for checking and approving drawings can be identified.

Element 9.3A.3 Prepare engineering parts list**Criteria 9.3A.3.1**

Components parts identified and organised by component type and/or in accordance with organisation/customer requirements.

Assessor guide: observe that –

The component parts list is produced with part name, description of part, material specification or part number, quantities and all other details specified by the customer and/or organisational procedures.

Assessor guide: confirm that –

The consequences of inappropriate/incomplete components parts lists can be explained.

Element 9.3A.4 Issue drawing**Criteria 9.3A.4.1**

Complete drawings and or parts lists records in accordance with standard operating procedures.

Assessor guide: observe that –

Completed drawings and or parts lists are recorded in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for recording completed drawings and or parts lists can be given. The reasons for recording completed drawings and or parts lists can be explained.

Criteria 9.3A.4.2

Copy/issue approved drawings and or parts lists to relevant personnel in accordance with standard operating procedures.

Assessor guide: observe that –

Where appropriate, approved drawings and or parts lists are copied in accordance with standard operating procedures. Where appropriate, approved drawings and or parts lists are issued to relevant personnel in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for copying approved drawings and or parts lists can be given. The procedures for issuing approved drawings and or parts lists can be given. The personnel to whom copies of approved drawings and or parts lists can be issued can be identified.

Criteria 9.3A.4.3

Approved drawings and or parts lists stored and catalogued in accordance with standard operating procedures.

Assessor guide: observe that –

The approved drawings and or parts lists is appropriately handled and stored in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for filing approved drawings and or parts lists can be given. The procedures for safe handling and storage of drawings and or parts lists can be given. The consequences of inappropriate handling and storage of approved drawings and or parts lists can be explained.

Range statement

This unit applies to any of the full range of engineering disciplines. Drafting and drawing equipment includes the use of Computer Aided Drafting systems. Where a more extensive Computer Aided Drafting System is used for design, then Unit 9.9B (Create 2D drawings using computer aided design system), should also be considered. Applied to the fields of mechanical, electrical/electronic, fabrication, fluid power. Specifications may be obtained from design information, customer ideas/concepts/expectations/requirements, sketches, preliminary layouts. Consultations may include reference to appropriate personnel including technical supervisory, manufacturers, suppliers, contractors, customers, etc. Drawing records may include cataloguing, issuing security classifications, filing, preparing distribution lists. Drawings, copies may be issued in hard copy, photographic, slide or transparency form including presentation as a single drawing and/or with other drawings, support documentation as a package.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the preparation of basic engineering drawings or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 9.4B A Electrical/electronic detail drafting

Band – Specialisation band B

Field – Drawing, drafting & design

Unit Weight 8

Pre-requisite units - Path 1

9.2A Interpret technical drawing

9.3A Prepare basic engineering drawing

Element 9.4B.1 Prepare/make changes to electrical/electronic schematics and drawings

Criteria 9.4B.1.1

Schematic drawn to indicate relative positioning of electrical/electronic components.

Assessor guide: observe that –

The electrical/electronic schematic is drawn correctly and indicates the relative position of the components.

Assessor guide: confirm that –

The relative position of the electrical/electronic components can be identified. The symbols used in electrical/electronic schematics and drawings can be correctly identified.

Criteria 9.4B.1.2

Electrical/electronic drawings produced to include all relevant specifications.

Assessor guide: observe that –

The electrical/electronic drawings produced include all relevant specifications.

Assessor guide: confirm that –

The specifications of all components can be identified. The circuit specifications can be identified.

Criteria 9.4B.1.3

Schematic/drawing completed to Australian Standard 1102 or equivalent.

Assessor guide: observe that –

Electrical/electronic schematics/drawings are produced in conformance with AS1102 or equivalent.

Assessor guide: confirm that –

The requirements of AS1102 or equivalent with respect to electrical/electronic schematics/drawings can be identified.

Element 9.4B.2 Determine component and/or material requirement

Criteria 9.4B.2.1

Components and/or materials are selected from supplier/manufacturer's catalogues using design specifications.

Assessor guide: observe that –

The circuit/component specifications are obtained in accordance with work place procedures.

Assessor guide: confirm that –

The design specifications of the circuit/components can be identified. The appropriate components and materials are selected from supplier/manufacturers' catalogues. The reasons for selecting the chosen components and/or materials can be given.

Range statement

This unit applies to the production of drawings produced under supervision, in accordance with instructions and specifications to Australian Standard 1102 or equivalent using predetermined design specifications. Drawings include plans, schematics, layouts, circuit diagrams and charts. This unit applies to all electrical/electronic areas. Manual drafting or drawing equipment is used or where a CAD system is used, Unit 9.9B (Create 2D drawings using computer aided design system) and/or Unit 9.10B (Create 3D models using computer aided design system) should also be considered.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the preparation of basic engineering drawings or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 9.5A A Basic engineering detail drafting

Band – Specialisation band A

Field – Drawing, drafting & design

Unit Weight 8

Pre-requisite units - Path 1

9.2A Interpret technical drawing

9.3A Prepare basic engineering drawing

Element 9.5A.1 Prepare assembly, layout and detail drafting

Criteria 9.5A.1.1

Drawings prepared in plane orthogonal, isometric projection or equivalent including auxiliary views and sections to Australian Standard 1100.

Assessor guide: observe that –

Drawings are prepared using appropriate projections and views in accordance with AS1100 or equivalent.

Assessor guide: confirm that –

The appropriate projection for the drawing purpose can be identified. The reasons for selecting the chosen projection can be given. The reasons for including auxiliary views in drawings can be given.

Criteria 9.5A.1.2

Layout, assembly and component drawings are prepared from specification.

Assessor guide: observe that –

Layout, assembly and component drawings are produced in conformance with specification.

Assessor guide: confirm that –

The specifications for the components, layout and/or assembly can be identified.

Criteria 9.5A.1.3

Drawings dimensioned and labelled using supplied tolerances in accordance with Australian Standard 1100.

Assessor guide: observe that –

All relevant dimensions, tolerances and instructions are included in the drawing.

Assessor guide: confirm that –

The dimensions, tolerances and instructions relevant to the component, layout and/or assembly can be identified. The requirements of AS1100 or equivalent with respect to dimensions, tolerances and labels can be identified.

Criteria 9.5A.1.4

Drawing produced to specification in accordance with standard operating procedures.

Assessor guide: observe that –

Drawings are produced to specification in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for producing component, layout and/or assembly drawings can be given. The drawing specifications can be identified.

Criteria 9.5A.1.5

Standard symbols to Australian Standard 1100 or equivalent are used to specify requirements.

Assessor guide: observe that –

Standard symbols in accordance with AS1100 or equivalent are appropriately used in the drawings produced.

Assessor guide: confirm that –

The reasons for using symbols in drawings can be explained. The common symbols used in drawings to AS1100 or equivalent can be identified and interpreted correctly.

Element 9.5A.2 Determine component and/or material requirement**Criteria 9.5A.2.1**

Components and/or materials are selected from supplier/manufacturer's catalogues using design specifications.

Assessor guide: observe that –

The component specifications are obtained in accordance with work place procedures.

Assessor guide: confirm that –

The design specifications of the component can be identified. The appropriate components and materials are selected from supplier/ manufacturers' catalogues. The reasons for selecting the chosen components and/or materials can be given.

Range statement

This unit applies to the production of drawings to Australian Standard 1100 or equivalent where the critical dimensions and associated tolerances and design specifications are predetermined. Manual drafting or drawing equipment is used or where a CAD (Computer aided design) system is used, Unit 9.9B (Create 2D drawings using computer aided design system) and/or Unit 9.10B (Create 3D models using computer aided design system) should also be considered.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with engineering detail drafting or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 9.6B A Advanced engineering detail drafting

Band – Specialisation band B

Field – Drawing, drafting & design

Unit Weight 4

Pre-requisite units - Path 1

9.2A Interpret technical drawing

9.3A Prepare basic engineering drawing

9.5A Basic engineering detail drafting

Element 9.6B.1 Prepare assembly, layout and detail drawing

Criteria 9.6B.1.1

Specification requirements determined.

Assessor guide: observe that –

All relevant work instructions, requirements are obtained in accordance with workplace procedures.

Assessor guide: confirm that –

The specifications and/or requirements of the component, assembly or layout to be drawn can be identified.

Criteria 9.6B.1.2

Engineering calculations undertaken to determine all dimensions including limits and fits, surface texture, datum references and geometric tolerances where appropriate to ensure functional operation and suitability.

Assessor guide: observe that –

Assessor guide: confirm that –

The functional operation of the component/assembly to be drawn can be identified. Surfaces which are to be in contact or separated can be identified. The appropriate type of fit for contacting surfaces can be identified. The reasons for selecting the chosen type of fit can be given. The effect of surface finish on the performance/operation of surfaces can be identified. Appropriate datum points can be identified. All appropriate lineal, diametral and geometric tolerances are calculated in accordance with standard operating procedures. The procedures for determining tolerances can be given.

Criteria 9.6B.1.3

All drawings produced to Australian Standard 1100 or equivalent.

Assessor guide: observe that –

All drawings are produced in accordance with AS1100 or equivalent.

Assessor guide: confirm that –

The requirements of AS1100 or equivalent for the drawing(s) to be produced can be identified.

Element 9.6B.2 Interpret specifications and select material, components and/or assemblies**Criteria 9.6B.2.1**

Components, material and/or assemblies selected from data sheets or manufacturers' catalogue to meet specifications.

Assessor guide: observe that –

All relevant data sheets, catalogues, etc. are obtained in accordance with workplace procedures.

Assessor guide: confirm that –

The specifications of the components, materials and/or assemblies can be identified. The appropriate components and materials are selected from supplier/manufacturers' catalogues. The reasons for selecting the chosen components and/or materials can be given.

Element 9.6B.3 Check drawings**Criteria 9.6B.3.1**

Drawings checked to ensure compliance with specifications.

Assessor guide: observe that –

Drawings are checked for conformance to specification in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for checking and approving drawings can be given. The reasons for checking drawings can be explained. The drawing specifications can be identified.

Criteria 9.6B.3.2

Drawings checked to ensure that assembly/fabrication is possible.

Assessor guide: observe that –

Drawings are checked to ensure that assembly/fabrication is possible in accordance with standard operating procedures.

Assessor guide: confirm that –

The methods of manufacture/assembly/fabrication can be identified from the drawing(s) being checked. Unnecessary or inappropriate tolerances can be identified. The reasons for checking the drawings to ensure that manufacturing/assembly is possible, efficient and cost effective can be explained.

Range statement

This unit applies to the production of assembly, layout and detail drawings to Australian Standard 1100 or equivalent. Skills covered by this unit are applied individually or in a team environment where comprehensive responsibility for the production of the drawing is exercised, critical dimensions and associated tolerances are determined where required. Manual drafting and drawing equipment is used or where a CAD (Computer aided design) system is used, Unit 9.9B (Create 2D drawings using computer aided design system) and/or Unit 9.10B (Create 3D models using computer aided design system)

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with engineering detail drafting or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 9.7B A Advanced mechanical detail drafting

Band – Specialisation band B

Field – Drawing, drafting & design

Unit Weight 4

Pre-requisite units - Path 1

- 9.2A Interpret technical drawing
- 9.6B Advanced engineering detail drafting

9.3A Prepare basic engineering drawing

9.5A Basic engineering detail drafting

Element 9.7B.1 Prepare mechanical assembly, layout and detail drawing

Criteria 9.7B.1.1

All drawings produced to Australian Standard 1100 or equivalent.

Assessor guide: observe that –

All drawings are produced in accordance with AS1100 or equivalent. The function of each component within the assembly/layout is represented in accordance with design specifications/operational requirements. All components can be manufactured, fabricated and assembled in accordance with the specifications contained in the drawings. Where appropriate, all components are correctly orientated to surrounding structures and services. Where appropriate, drawings are modified to ensure conformance to specification AS1100 or equivalent, and/or changes to production, assembly and fabrication requirements and/or the availability of standard hardware items etc.

Assessor guide: confirm that –

The function of each component within the assembly/layout can be identified. The manufacturing, fabrication and assembly procedures to be used in producing the components/assemblies can be identified. The reason for ensuring that all components are correctly orientated to existing or proposed structures and services can be explained. The reasons for updating/modifying drawings to incorporate changes to specifications, production, assembly and fabrication methods and availability of standard hardware items, etc can be explained.

Range statement

This unit applies to the production of mechanical assembly, mechanical layout and detail drawings to AS1100 or equivalent. Skills covered by this unit are applied individually or in a team environment where comprehensive responsibility for the production of the drawing is exercised, critical dimensions and associated tolerances are determined where required. Manual drafting and drawing equipment is used or where a CAD system is used, Unit 9.9B (Create 2D drawings using computer aided design system) and/or Unit 9.10B (Create 3D models using computer aided design system) should also be considered.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with mechanical detail drafting or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 9.8B A Advanced structural detail drafting

Band – Specialisation band B

Field – Drawing, drafting & design

Unit Weight 4

Element 9.8B.1 Prepare fabrication/structural assembly, layout and detail drawing

Criteria 9.8B.1.1

All drawings produced to Australian Standard 1100 or equivalent.

Assessor guide: observe that –

All drawings are produced in accordance with AS1100 or equivalent. The function of each component within the assembly/layout is represented in accordance with design specifications/operational requirements. All components can be manufactured, fabricated and assembled in accordance with the specifications contained in the drawings. Where appropriate, all components are correctly orientated to surrounding structures and services. Where appropriate, drawings are modified to ensure conformance to specification AS1100 or equivalent, and/or changes to production, assembly and fabrication requirements and/or the availability of standard hardware items etc.

Assessor guide: confirm that –

The function of each component within the assembly/layout can be identified. The manufacturing, fabrication and assembly procedures to be used in producing the components/assemblies can be identified. The reason for ensuring that all components are correctly orientated to existing or proposed structures and services can be explained. The reasons for updating/modifying drawings to incorporate changes to specifications, production, assembly and fabrication methods and availability of standard hardware items, etc can be explained.

Range statement

This unit applies to the production of fabrication/structural assembly, fabrication/structural layout and detail drawings to AS 1100 or equivalent. Skills covered by this unit are applied individually or in a team environment where comprehensive responsibility for the production of the drawing is exercised, critical dimensions and associated tolerances are determined where required. Manual drafting and drawing equipment is used or where a CAD system is used, Unit 9.9B (Create 2D drawing using computer aided design system) and/or Unit 9.10B (Create 3D models using computer aided design system) should also be considered.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with structural detail drafting or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 9.9B B Create 2D drawings using computer aided design system

Band – Specialisation band B

Field – Drawing, drafting & design

Unit Weight 8

Pre-requisite units - Path 1

2.9C10 Perform computer operations

9.2A Interpret technical drawing

Element 9.9B.1 Prepare CAD environment

Criteria 9.9B.1.1

System variables are customised to suit standard operating procedure.

Assessor guide: observe that –

All relevant manuals, instructions and operation procedures for the CAD software and hardware being used, are obtained in accordance with work place procedures. Where appropriate, the relevant system variables are customised to suit the applicable drafting standards/procedures.

Assessor guide: confirm that –

The CAD software system can be identified. The system variables that can be customised can be identified. The procedures for customising identified system variables can be given. The reasons for customising the system variables can be explained. The applicable drafting standards/ procedures can be identified.

Criteria 9.9B.1.2

Menus are customised to suit standard operating procedure.

Assessor guide: observe that –

Where appropriate, menus are customised to suit the applicable drafting standards/procedures.

Assessor guide: confirm that –

The procedures for customising menus can be given. The reasons for customising menus can be explained.

Criteria 9.9B.1.3

Drawing defaults are customised to standard operating procedure.

Assessor guide: observe that –

Where appropriate, the system defaults are customised to suit the applicable drafting standards/procedures.

Assessor guide: confirm that –

The procedures for customising system defaults can be given. The reasons for customising system defaults can be explained.

Criteria 9.9B.1.4

Macros are developed to standard operating procedure.

Assessor guide: observe that –

Where appropriate, macros are developed in accordance with standard operating procedures and in conformance with the applicable drafting standards/procedures.

Assessor guide: confirm that –

The procedures for developing macros can be given. The reasons for developing macros can be explained.

Element 9.9B.2 Create 2D drawings**Criteria 9.9B.2.1**

Drawings are created using the full capability of the available software system.

Assessor guide: observe that –

Drawings are created using the appropriate drawing features of the software system.

Assessor guide: confirm that –

The drawing features of the CAD software system can be identified. The reasons for using specialised software features can be explained.

Criteria 9.9B.2.2

Drawing entities are linked to database attributes to suit job requirements.

Assessor guide: observe that –

Where appropriate, drawing entities are linked to database attributes in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for linking drawing entities to database attributes can be explained.

Criteria 9.9B.2.3

Detailed views are created using various scales to meet job requirements.

Assessor guide: observe that –

Detailed views of the object being drawn are produced in accordance with standard operating procedures. Drawing files are printed at the appropriate scale in accordance with standard operating procedures.

Assessor guide: confirm that –

The appropriate scale for the drawing to be printed can be identified. The procedures for printing drawing files can be given. The procedures for creating additional views of the object being drawn can be given.

Element 9.9B.3 Produce output**Criteria 9.9B.3.1**

Files are saved in various formats to standard operating procedure.

Assessor guide: observe that –

Drawing files are saved in the appropriate format in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for saving drawing files can be given. The various formats in which drawing files can be saved can be identified. The reasons for using different formats when saving drawing files can be explained.

Criteria 9.9B.3.2

Linked entities are listed in a bill of materials format to meet job requirements.

Assessor guide: observe that –

Bills of material are produced from the drawing files/database in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for producing bills of material can be given.

Criteria 9.9B.3.3

Supplementary data is extracted from drawing to meet job requirements and may include area, lengths, angles and perimeters.

Assessor guide: observe that –

Supplementary data is extracted from the drawing file to meet job requirements in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for extracting data with respect to drawn shapes/ features can be given. The properties of shapes/sections/ features that can be extracted from the drawing file can be identified.

Range statement

This unit applies to the production of 2D drawings, linked bills of material, file management and associated customisation of installed software including the use of macros, menus and default settings; file formats may include IGES, DXF, HPGL. Entity means any single item created on the screen and includes for example: lines, arcs, circles, text, hatch and dimensions. Attribute means properties associated with an entity and includes for example: layer or level, line type, line width, colour and text. Drawings include plans, diagrams, charts and electrical/electronic circuits. Applies to the fields of mechanical, electrical/electronic, fabrication, fluid power. 2D drawings may be produced from 3D models created using computer aided design system. Where detail drafting skills are required, the following units should be considered: Unit 9.4B (Electrical/electronic detail drafting), Unit 9.5A (Basic engineering detail drafting), Unit 9.6B (Advanced engineering detail drafting).

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with computer aided drafting of 2D drawings or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 9.10B B Create 3D models using computer aided design system

Band – Specialisation band B

Field – Drawing, drafting & design

Unit Weight 4

Pre-requisite units - Path 1

2.9C10 Perform computer operations

9.2A Interpret technical drawing

9.9B Create 2D drawings using computer aided design system

Element 9.10B.1 Prepare 3D environment

Criteria 9.10B.1.1

Coordinate system is established to job requirement.

Assessor guide: observe that –
The relevant job instructions, specifications, etc. are obtained in accordance with workplace procedures.

Assessor guide: confirm that –
The purpose for which the 3D model is to be developed can be identified. The appropriate coordinate system for the job can be identified. The reasons for selecting the chosen coordinate system can be given.

Criteria 9.10B.1.2

Orientation is established to job requirement.

Assessor guide: observe that –

Assessor guide: confirm that –
The orientation of the model with respect to the coordinate system can be identified.

Criteria 9.10B.1.3

Views are established to job requirement.

Assessor guide: observe that –

Assessor guide: confirm that –
The number of views required to establish the model can be identified.

Element 9.10B.2 Create and modify 3D model

Criteria 9.10B.2.1

Entities are created in 3D space to job requirement.

Assessor guide: observe that –
The appropriate entities are created in 3D space in conformance with job requirements.

Assessor guide: confirm that –
The procedures for creating entities in 3D space can be given. The entities that can be created/manipulated in 3D space can be identified.

Criteria 9.10B.2.2

Entities are manipulated in 3D space to job requirement.

Assessor guide: observe that –

The entities are manipulated in 3D space in accordance with job requirements and standard operating procedures.

Assessor guide: confirm that –

The procedures for manipulating entities in 3D space can be given.

Criteria 9.10B.2.3

Surfaces are created in 3D space to job requirement including ruled and revolved.

Assessor guide: observe that –

Ruled and revolved surfaces are created in 3D space in accordance with job requirements and standard operating procedures.

Assessor guide: confirm that –

The procedures for creating ruled and revolved surfaces in 3D space can be given. The applications of ruled and revolved surfaces can be identified.

Criteria 9.10B.2.4

Existing 3D model is modified to job requirement.

Assessor guide: observe that –

Where appropriate, existing 3D models are modified in accordance with job requirements and standard operating procedures.

Assessor guide: confirm that –

The procedures for modifying existing 3D models can be given. The reasons for modifying existing 3D models can be explained.

Element 9.10B.3 Produce output from 3D model**Criteria 9.10B.3.1**

File is saved in various formats for retrieval as per standard operating procedure.

Assessor guide: observe that –

Drawing files are saved in the appropriate format in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for saving drawing files can be given. The various formats in which drawing files can be saved can be identified. The reasons for using different formats when saving drawing files can be explained.

Criteria 9.10B.3.2

Physical properties are extracted to job requirement including volume, mass and centre of gravity.

Assessor guide: observe that –

The physical properties of shapes created in 3D space are extracted from the drawing file to meet job requirements in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for extracting data with respect to the physical properties of shapes created in 3D space can be given. The physical properties of shapes created in 3D space that can be extracted from the drawing file can be identified.

Range statement

This unit applies to the production of 3D models utilising computer equipment. Operations at this level include, but are not limited to, the creation and manipulation of entities such as arcs and lines and primitives such as spheres, cones, cylinders and boxes using industrial software. Applies to the fields of mechanical, electrical/electronic, fabrication, fluid power.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with 3D modelling using a CAD system or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 9.11A A Apply basic engineering design concepts

Band – Specialisation band A

Field – Drawing, drafting & design

Unit Weight 6

Pre-requisite units - Path 1

9.1A Draw and interpret sketch

9.2A Interpret technical drawing

Element 9.11A.1 Determine design requirements

Criteria 9.11A.1.1

Design requirement is established from job sheets, instructions or in consultation with appropriate people.

Assessor guide: observe that –

All relevant drawings, job sheets, instructions and specifications are obtained in accordance with workplace procedures. Where appropriate, relevant personnel are consulted as to the design requirements. Where appropriate, the object, plant or equipment to which engineering design concepts are to be applied are inspected by the individual.

Assessor guide: confirm that –

The design requirements can be identified.

Criteria 9.11A.1.2

Design concepts are established and may include consideration of process, material, quantity, cost and outcome.

Assessor guide: observe that –

Assessor guide: confirm that –

The functional requirements of the design can be identified. The material(s) appropriate to the environment in which the object(s) to be designed is to operate can be identified. The processes to be used in the manufacture of the object(s) can be identified. Where appropriate the costs associated with the manufacture of the object(s) can be calculated. The reasons for selecting the chosen design concept can be explained.

Criteria 9.11A.1.3

Where appropriate, codes, regulations and technical documentation are consulted to establish design limitations in accordance with standard operating procedures.

Assessor guide: observe that –

Where appropriate, design limitations imposed by relevant codes, standards and regulations are accurately determined.

Assessor guide: confirm that –

All relevant codes, standards and regulations applying to the object to be designed can be identified. The impact of the applicable codes, standards and regulations on the design requirements of the object can be explained.

Criteria 9.11A.1.4

Sources of expert assistance are identified and used as required.

Assessor guide: observe that –

Where appropriate, assistance is sought from relevant sources in accordance with standard operating procedures.

Assessor guide: confirm that –

Sources of expert assistance in the design process can be identified.

Element 9.11A.2 Create design**Criteria 9.11A.2.1**

Design meets end use requirement.

Assessor guide: observe that –

Assessor guide: confirm that –

The end use requirements of the design can be clearly identified.

Criteria 9.11A.2.2

Design meets all legislative and regulatory requirements.

Assessor guide: observe that –

Assessor guide: confirm that –

The design complies with the relevant codes, standards, legislative and regulatory requirements.

Criteria 9.11A.2.3

Design concept verified in accordance with standard operating procedures.

Assessor guide: observe that –

The design concept is verified in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for verifying design concepts can be identified.

Criteria 9.11A.2.4

Design outcome is produced as per job requirements and may include sketch, drawing, prototype, document, model or finished product.

Assessor guide: observe that –

The design object is presented in a form appropriate to the job requirements and in accordance with standard operating procedures.

Assessor guide: confirm that –

The means by which the design concept is to be presented can be identified.

Range statement

This unit is intended to cover in situ design skills by personnel who will then be responsible for the manufacture of the design outcome either individually or as part of a team. This unit includes the determination of requirements such as location, assembly or other parts of the manufacturing or engineering process and where the designer must consider the impact of the design on other equipment, process or personnel, for example safety aspects of the design. Design tasks undertaken include the application of design concepts to eg: the fabrication and modification of structures, plant and equipment, design of tooling and gauges, production control systems, fluid power layouts, electrical circuits etc. Applies to the fields of mechanical, production, electrical/electronic, fabrication and fluid power.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the drawing and interpretation of sketches or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other means of communication, answer questions put by an assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 9.21A A Interpret and produce curved 3-dimensional shapes

Band – Specialisation band A

Field – Drawing, drafting & design

Unit Weight 4

This unit covers the competencies required to produce and interpret lines plan drawings manually or using CAD equipment. Typical applications include marine vessel construction.

Element 9.21A.1 Identify drawing/lofting requirements

Criteria 9.21A.1.1 Requirements of lines drawing/lofting are determined *Assessor guide: observe that –*

Assessor guide: confirm that –

Criteria 9.21A.1.2 Data necessary to produce drawing/lofting are identified *Assessor guide: observe that –*

Assessor guide: confirm that –

Element 9.21A.2 Determine drawing/lofting procedure and equipment

Criteria 9.21A.2.1 Lines drawing/lofting procedures are outlined and understood *Assessor guide: observe that –*

Assessor guide: confirm that –

Criteria 9.21A.2.2 Appropriate drawing equipment/accessories are outlined *Assessor guide: observe that –*

Assessor guide: confirm that –

Element 9.21A.3 Apply drawing/lofting procedures

Criteria 9.21A.3.1 Appropriate drawing equipment/accessories are set-up to suit requirements *Assessor guide: observe that –*

Assessor guide: confirm that –

Criteria 9.21A.3.2 Drafting/lofting procedures to suit specified drawing are applied *Assessor guide: observe that –*

Assessor guide: confirm that –

<p>Criteria 9.21A.3.3 Where applicable, any alterations to offset measurements are recorded</p>	<p><i>Assessor guide: observe that –</i></p>	<p><i>Assessor guide: confirm that –</i></p>
<p>Criteria 9.21A.3.4 Drawings/loftings are consistent with operation procedures and industry requirements</p>	<p><i>Assessor guide: observe that –</i></p>	<p><i>Assessor guide: confirm that –</i></p>
<p>Element 9.21A.4 Submit lines plan drawings</p>		
<p>Criteria 9.21A.4.1 Completed drawings in accordance with industry standards are submitted</p>	<p><i>Assessor guide: observe that –</i></p>	<p><i>Assessor guide: confirm that –</i></p>
<p>Criteria 9.21A.4.2 Where applicable, altered offset measurements and relevant information related to drawing are supplied</p>	<p><i>Assessor guide: observe that –</i></p>	<p><i>Assessor guide: confirm that –</i></p>

Range statement

This unit applies to drawing and lofting principles relevant to procedures used to produce lines plan drawings and loftings. Common applications include marine vessel construction. In a marine setting, tasks may be related to a variety of hull designs, section development such as curved and raking transom, conical development and camber development methods. General arrangement plans may also be addressed to provide a greater drawing diversity. Drawing practices should be completed using manual drafting and drawing equipment. All drawings/data should comply with industry requirements. Basic lofting is covered by Unit 12.7A (Mark out structural fabrications and shapes). Where a CAD system is used for basic drawing, Unit 9.3A (Prepare basic engineering drawing) should also be selected. Where more extensive CAD system is used for design then Unit 9.9B (Create 2D drawings using computer aided design system) should also be considered. Where transfer of lines to lofting floor or other surface is carried out, Unit 12.7A (Mark off/out structural fabrications and shapes) should also be selected.

Evidence guide**Assessment context**

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with computer aided drafting of 2D drawings or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 10.1A B Erect structures

Band – Specialisation band A

Field – Installation & commissioning

Unit Weight 4

Pre-requisite units - Path 1

5.7A Manual heating and thermal cutting
 9.1A Draw and interpret sketch
 18.1A Use hand tools

5.12A Perform routine manual metal arc welding
 9.2A Interpret technical drawing
 18.2A Use power tools/hand held operations

5.15A Weld using manual metal arc welding process
 12.6A Mark off/out (general engineering)

Pre-requisite units - Path 2

5.7A Manual heating and thermal cutting
 9.1A Draw and interpret sketch
 18.1A Use hand tools

5.17A Weld using gas metal arc welding process
 9.2A Interpret technical drawing
 18.2A Use power tools/hand held operations

5.50A Perform routine gas metal arc welding
 12.6A Mark off/out (general engineering)

Pre-requisite units - Path 3

5.4A Perform routine oxy acetylene welding
 9.2A Interpret technical drawing
 18.2A Use power tools/hand held operations

5.7A Manual heating and thermal cutting
 12.6A Mark off/out (general engineering)

9.1A Draw and interpret sketch
 18.1A Use hand tools

Pre-requisite units - Path 4

5.7A Manual heating and thermal cutting
 9.1A Draw and interpret sketch
 18.1A Use hand tools

5.12A Perform routine manual metal arc welding
 9.2A Interpret technical drawing
 18.2A Use power tools/hand held operations

5.15A Weld using manual metal arc welding process
 12.7A Mark off/out structural fabrications and shapes

Pre-requisite units - Path 5

5.7A Manual heating and thermal cutting
 9.1A Draw and interpret sketch
 18.1A Use hand tools

5.17A Weld using gas metal arc welding process
 9.2A Interpret technical drawing
 18.2A Use power tools/hand held operations

5.50A Perform routine gas metal arc welding
 12.7A Mark off/out structural fabrications and shapes

Pre-requisite units - Path 6

5.4A Perform routine oxy acetylene welding
 9.2A Interpret technical drawing
 18.2A Use power tools/hand held operations

5.7A Manual heating and thermal cutting
 12.7A Mark off/out structural fabrications and shapes

9.1A Draw and interpret sketch
 18.1A Use hand tools

Element 10.1A.1 Inspect and prepare erection site

Criteria 10.1A.1.1

Site checked for correct location, dimensions and levels.

Assessor guide: observe that –

All relevant drawings, specifications and instructions are obtained in accordance with workplace procedures. The site is checked for correct location, dimensions and, where appropriate, levels in accordance with standard operating procedures.

Assessor guide: confirm that –

The work to be undertaken can be identified. The location, dimensions and levels applicable to the work to be undertaken can be identified. Where appropriate, the technique/equipment to be used to check the site levels can be identified.

Criteria 10.1A.1.2

Non-compliance with specifications reported to appropriate authority.

Assessor guide: observe that –

Where appropriate, any non-compliances with specifications detected are reported to the appropriate authority in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures to be followed if the location, dimensions and/or levels of the site do not comply with the specifications can be given. The appropriate authority to which non-compliances are to be reported can be given.

Criteria 10.1A.1.3

Minor alterations, corrections or adjustments undertaken with approval of appropriate authority.

Assessor guide: observe that –

Where appropriate, authorised alterations, corrections or adjustments are made to the site and/or structure in accordance with standard operating procedures.

Assessor guide: confirm that –

Any alterations, corrections or adjustments to be made to the site can be identified. Any alterations, corrections or adjustments to be made to the structure can be identified. The appropriate authority to approve alterations, corrections or adjustments to the site and/or structure can be identified. Approval for any alterations, corrections or adjustments to be made has been received from the appropriate authority. The methods/techniques to be utilised in carrying out the alterations, corrections can be identified. The reasons for selecting the chosen methods/techniques can be explained.

Criteria 10.1A.1.4

All surfaces and materials/components prepared for use.

Assessor guide: observe that –

Where appropriate, surfaces, materials and/or components are prepared for use in accordance with specifications and standard operating procedures.

Assessor guide: confirm that –

The material and components to be used in the structure can be identified. Any preparation of surfaces required prior to commencing the erection of the structure can be identified.

Criteria 10.1A.1.5

Structure components identified and checked against specifications.

Assessor guide: observe that –

All components of the structure are checked for conformance to specification in accordance with standard operating procedure.

Assessor guide: confirm that –

The specification of the components of the structure can be identified. The procedures for checking the components of the structure can be given.

Element 10.1A.2 Erect structures**Criteria 10.1A.2.1**

All work carried out safely and in accordance with defined procedures.

Assessor guide: observe that –

All work is carried out safely to specification and in accordance with standard operating procedures.

Assessor guide: confirm that –

The safety procedures to be followed while undertaking the work can be identified. All safety equipment and personal protective clothing to be used/worn while undertaking the work can be identified. The hazards associated with the erection of structures can be identified.

Criteria 10.1A.2.2

Structure components prepared for correct sequential erection.

Assessor guide: observe that –

All components of the structure are prepared for correct sequential erection in accordance with standard operating procedures.

Assessor guide: confirm that –

The sequence in which components of the structure are to be erected can be identified.

Criteria 10.1A.2.3

Components erected and fixed according to specifications.

Assessor guide: observe that –

All components of the structure are erected and fixed in conformance to specifications and in accordance with standard operating procedures.

Assessor guide: confirm that –

The methods of fixing/fastening the components of the structure can be identified. The methods of lifting/moving the components of the structure can be identified. The methods of locating/holding the components of the structure prior to fixing/fastening can be identified. The reasons for selecting the chosen methods of lifting/moving and locating/holding the components of the structure can be given.

Criteria 10.1A.2.4

Structure adjusted to specifications.

Assessor guide: observe that –

The structure is checked for conformance to specifications in accordance with standard operating procedures. Where appropriate, the approved adjustments are made to the structure in accordance with specifications and standard operating procedures.

Assessor guide: confirm that –

The procedures to be followed if the structure does not comply with the specifications can be identified. The authority to whom non-conformances are to be reported can be identified. The procedures for checking the structure for conformance to specification can be given. Where appropriate, adjustments to be made to bring the structure into specification can be identified. The appropriate authority to approve adjustments to the structure can be identified. Approval for any adjustments to be made has been received from the appropriate authority.

Criteria 10.1A.2.5

All reports, documentation completed correctly to required specifications.

Assessor guide: observe that –

All required reports and documentation are completed correctly and in accordance with standard operating procedures.

Assessor guide: confirm that –

The reports and/or documentation to be completed before, during and after erection of the structure can be identified.

Range statement

Work generally undertaken in team environment (but not exclusively). Structures covered by this unit are those requiring a location/erection process different to workshop assembly techniques described in Unit 5.11A (Assemble fabricated components). The structure would typically be of a substantial size and load bearing and/or building regulations may apply. Specifications for the structure would be supplied via engineering drawings or the like and would include site location information. Structures include metal frameworks, stairways, walkways, vessels, tanks, platforms, conveyors and moving lines, etc. including associated railings, foundations, footings completed prior to commencement of installation work. Levelling and alignment undertaken is of a straightforward nature using plumb bob/lines and levels. Where lifting or rigging skills are required, appropriate units should be accessed. Where design skills are required, refer to Unit 9.11A (Apply basic engineering design concepts). All work and work practices undertaken to regulatory and legislative requirements. When mark-off/out skills are required, then Unit 12.7A (Mark off/out structural fabrications and shapes) should also be selected. Where welds are required to meet legislative or regulating requirements then appropriate welding units should also be selected.

Evidence guide

Assessment context

This unit should be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the erection of structures or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 10.2A A Terminate and connect electrical wiring

Band – Specialisation band A

Field – Installation & commissioning

Unit Weight 3

Pre-requisite units - Path 1

9.2A Interpret technical drawing

12.2A Electrical/electronic measurement

18.1A Use hand tools

Element 10.2A.1 Prepare for electrical wiring termination and connection

Criteria 10.2A.1.1

All work undertaken safely and to workplace procedures and state/territory regulations and legislative requirements.

Assessor guide: observe that –

All work is undertaken in accordance with work site procedures and relevant statutory requirements.

Assessor guide: confirm that –

Safety hazards associated with the termination and connection of electrical wiring can be identified. Relevant statutory requirements associated with the termination and connection of electrical wiring can be identified.

Criteria 10.2A.1.2

Materials checked for correct specifications.

Assessor guide: observe that –

Materials are checked for conformance to specifications.

Assessor guide: confirm that –

Appropriate specifications for wiring materials can be identified.

Criteria 10.2A.1.3

Preparation of work undertaken or checked/inspected for correct location and specifications eg: cable trays, brackets, trenches etc.

Assessor guide: observe that –

Where appropriate, new installation site checked for correct location and specifications in accordance with work site procedures. Where appropriate, existing installation inspected for correct location and specifications in accordance with work site procedures.

Assessor guide: confirm that –

The location of the work to be undertaken can be identified. Any wiring support and/or protection requirements can be identified. The specifications of wiring support and/or protection requirements can be identified.

Element 10.2A.2 Connect electrical wiring

Criteria 10.2A.2.1

Terminations/connections made to specifications, manufacturers' requirements and to safety and state/territory regulations and legislative requirements.

Assessor guide: observe that –

All terminations/connections made to specification and comply with manufacturers' and regulatory requirements.

Assessor guide: confirm that –

The relevant regulatory requirements can be identified. The manufacturers' requirements can be identified.

Criteria 10.2A.2.2

All brackets, clamps, holders etc. adjusted and fixed to specifications.

Assessor guide: observe that –

All wiring support requirements are adjusted and fixed to specification.

Assessor guide: confirm that –

The appropriate wiring support technique can be identified. Alternative wiring support techniques can be given.

Criteria 10.2A.2.3

All cables, wires, conductors and connections etc. marked/tagged and labelled to specification.

Assessor guide: observe that –

All cables, wires, conductors and connections are marked, tagged and labelled to specification.

Assessor guide: confirm that –

The marking, tagging and labelling requirements for cables, wires, conductors and connections can be identified.

Criteria 10.2A.2.4

All completed wiring and connections tested for compliance with specifications.

Assessor guide: observe that –

The completed wiring and connections are tested for compliance to specification, safety in accordance with work site procedures.

Assessor guide: confirm that –

Appropriate tests for wiring and connections can be identified.

Criteria 10.2A.2.5

All reports, documentation completed correctly to required specifications.

Assessor guide: observe that –

All reports/documents completed in accordance with regulatory and work site procedures.

Assessor guide: confirm that –

The data to be recorded/reported and the frequency of recording/reporting can be identified.

Range statement

Work generally undertaken as part of team, (but not exclusively). Work is to be undertaken in accordance with relevant regulations and/or legislation. Connection of wiring includes termination and connection of cords and cables, excluding specialist cables, of all types, sizes and materials. Termination and connection includes the utilisation of a range of methods including clamping, pin connection, soldered joints, plugs, sockets etc., clamping of cables and wires, sealing entry points where required. This unit covers soldering/desoldering in the context of termination, disconnection or reconnection of electrical wiring and circuits. Soldering/desoldering of electrical/electronic components may also require the selection of Unit 5.1A (Manual soldering/desoldering - electrical/electronic components) or Unit 5.2A (High reliability soldering and desoldering) as applicable. All testing undertaken on completed circuits where not connected to main supply using appropriate methods eg: continuity and resistance checks. Specifications obtained from electrical/electronic circuit drawings and data sheets. Electrical services include power supplies, control, wiring, etc. This unit does not cover the competencies required for energising and testing of the circuit. If these skills are required the competencies covered in Unit 10.3A (Install and test electrical wiring and circuits (up to 1000vAC/1500vDC)) must be satisfied. Termination and connection of specialist cables such as mineral insulated, steel wire, armoured cables etc, is covered in Unit 10.11A (Terminate and connect specialist cables).

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the termination and connection of electrical wiring, or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Special notes

During assessment, the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities.

Unit MEM 10.3A A Install and test electrical wiring and circuits up to 1000vAC/1500vDC

Band – Specialisation band A

Field – Installation & commissioning

Unit Weight 8

This unit covers the competencies required to plan and prepare for the installation, install the wiring/enclosures and/or support systems and commission and test the installed wiring system. The installation of electrical wiring/systems and or enclosures includes the full range of installation materials and techniques. Where required work

is undertaken by or under the direction of an appropriately licensed person.

Pre-requisite units - Path 1

9.1A Draw and interpret sketch

12.2A Electrical/electronic measurement

18.49A Disconnect/reconnect fixed wired equipment which use up to 1000vAC/1500vDC

9.2A Interpret technical drawing

18.1A Use hand tools

10.2A Terminate and connect electrical wiring

18.2A Use power tools/hand held operations

Element 10.3A.1 Plan the installation

Criteria 10.3A.1.1

Special work, hazard and safety requirements determined and incorporated in plan

Assessor guide: observe that –

All relevant circuits, drawings, specifications and instructions obtained in accordance with standard operating procedures All relevant work, hazard and safety requirements are incorporated into the work plan

Assessor guide: confirm that –

The work to be undertaken can be identified The hazard and safety requirements applicable to the work to be undertaken can be correctly identified Where appropriate, work permit requirements can be identified

Criteria 10.3A.1.2

Work plan/strategy devised and confirmed in accordance with legislative and regulatory requirements and standard operating procedures

Assessor guide: observe that –

A work plan is prepared in accordance with legislative and regulatory requirements and standard operating procedures Where appropriate, the work plan is confirmed/authorised by the appropriate person/authority in accordance with standard operating

Assessor guide: confirm that –

The legislative and regulatory requirements appropriate to the work to be done can be identified The work planning procedures can be identified The sequence of operations to be performed can be given The reasons for selecting the chosen sequence of operations in the work plan can be explained Where appropriate, the person/ authority with whom the work plan is to be confirmed can be identified

Element 10.3A.2 Prepare for electrical installation

Criteria 10.3A.2.1

All work undertaken safely and to workplace procedures, state/territory regulations and legislative

Assessor guide: observe that –

All work is undertaken safely in accordance with relevant legislative and regulatory requirements and standard operating procedures

Assessor guide: confirm that –

Criteria 10.3A.2.2

Materials checked for correct specifications

Assessor guide: observe that –

All materials are checked for conformance to specification in accordance with standard operating procedures

Assessor guide: confirm that –

The specifications of all materials to be used while undertaking the work can be identified The procedures for checking materials against specifications can be given The procedures to be followed if materials do not conform to specification can be given

Element 10.3A.3 Install the wiring/enclosures and/or support systems**Criteria 10.3A.3.1**

All cables/wires/conduit/enclosures and support systems are installed to specifications using correct and appropriate techniques, tools and equipment

Assessor guide: observe that –

All cables/wires/conduit/enclosures and support systems are correctly installed in accordance with specifications using appropriate techniques, tools and equipment

Assessor guide: confirm that –

The techniques, tools and equipment required to install the following can be identified: - cables - wires - conduit - enclosures - support systems The items to be installed in carrying out the work can be identified

Criteria 10.3A.3.2

Cabling is marked or labelled for identification and to specification

Assessor guide: observe that –

The cabling is marked or labelled for identification in accordance with specifications and standard operating procedures

Assessor guide: confirm that –

The marking and/or labelling requirements of cabling can be identified The reasons for marking and/or labelling cables can be given

Element 10.3A.4 Commission and test the installed wiring system**Criteria 10.3A.4.1**

All completed wiring/systems and enclosures tested for compliance with specifications, regulations, and legislative requirements, utilising appropriate test procedures and equipment

Assessor guide: observe that –

All completed wiring/systems and enclosures are tested for compliance with specifications, relevant regulatory and legislative requirements The appropriate test equipment and procedures are carried out in conformance with standard operating procedures

Assessor guide: confirm that –

The procedures and equipment available to test wiring, systems and enclosures can be identified Appropriate test equipment and procedures for the work undertaken can be identified The reasons for selecting the chosen test equipment and procedures can be explained

Criteria 10.3A.4.2

Where appropriate, the installation may be energised and tested for compliance with specifications

Assessor guide: observe that –

Where appropriate, the installation is energised and tested for compliance with specifications in accordance with standard operating procedures

Assessor guide: confirm that –

Test procedures to be carried out on energised installations can be identified Where appropriate, the reasons for carrying out tests on energised installations can be explained

Criteria 10.3A.4.3

Any identified faults are rectified to specification

Assessor guide: observe that –

Where appropriate, identified faults are rectified to specification in accordance with standard operating procedures

Assessor guide: confirm that –

Common wiring system faults can be identified The method(s) of rectifying common faults can be given

Criteria 10.3A.4.4

All reports, documentation completed correctly to required specifications

Assessor guide: observe that –

All reports, documentation are completed correctly in accordance with standard operating procedures

Assessor guide: confirm that –

The reports/documentation to be completed during and after the work is undertaken can be identified

Element 10.3A.5 Perform emergency first aid**Criteria 10.3A.5.1**

Situation assessed to identify points of danger to the injured person and potential rescuer, including the assessment of electrical hazards

Assessor guide: observe that –

All potential points of danger are considered when planning a rescue or provision of assistance

Assessor guide: confirm that –

Dangers present in electrical rescue are identified

Criteria 10.3A.5.2

Electrical hazards are isolated in accordance with established procedures for electrical rescue

Assessor guide: observe that –

All electrical hazards are isolated in accordance with regulatory requirements, Work safe standards or site procedures

Assessor guide: confirm that –

Appropriate standards and procedures are identified

Criteria 10.3A.5.3

Rescue/recovery of injured person, or assistance to injured person undertaken in accordance with recognised standards/procedures Contact made with appropriate medical and rescue authorities

Assessor guide: observe that –

Appropriate procedures are followed for the movement/treatment of injured, including:

- clearing of airways
- CPR (cardio-pulmonary resuscitation)
- care of spinal injuries
- treatment of cuts/lesions etc
- treatment of burns/scalds
- treatment of shock

Assessor guide: confirm that –

Recognised procedures for the movement and treatment of injured persons are identified Appropriate local medical and rescue services identified

Criteria 10.3A.5.4

Details of first aid given recorded

Assessor guide: observe that –

Details of first aid are accurately recorded

Assessor guide: confirm that –

The details to be recorded of first aid given can be identified The procedures for recording first aid given can be identified The reasons for recording first aid given can be explained

Range statement

Work generally undertaken as part of a team. Work is to be undertaken in accordance with relevant regulation or legislation. Installation of electrical wiring/systems and/or enclosures, including specialist cables, includes the full range of installation materials and techniques. The installation includes the utilisation of a range of methods, tools, equipment appropriate to the work. All testing includes the use of polarity testers, phase rotation testers, insulation resistance/continuity testers and voltage testers etc. Specifications/regulations and drawings can refer to legislative Acts, SAA Wiring Rules Standards specifications, electrical and architectural drawings. Electrical installations can refer to any wiring circuits which are directly or indirectly connected to a power supply system. Where precision electrical/electronic measurement is required, see Unit 12.4A (Precision electrical/electronic measurement). For specialist cables Unit 10.11A (Terminate and connect specialist cables) should also be selected .

Evidence**Assessment context**

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the installation and testing of electrical wiring and circuits or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. - Standards and procedures for the provision of emergency first aid. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 10.4A A Enter and change programmable controller operational parameters

Band – Specialisation band A

Field – Installation & commissioning

Unit Weight 2

Pre-requisite units - Path 1

2.9C10 Perform computer operations

9.2A Interpret technical drawing

Element 10.4A.1 Install program

Criteria 10.4A.1.1

Download software in accordance with the requirements of Unit 2.9C10.4.3.

Assessor guide: observe that –

Appropriate data transfer device(s)/procedure(s) are selected. The software is transferred accurately.

Assessor guide: confirm that –

The appropriate and correct program loading technique is selected. The reasons for selecting the chosen program loading technique can be explained.

Criteria 10.4A.1.2

Appropriate checks undertaken during and after down loading to ensure data transfer is accurate and complete.

Assessor guide: observe that –

The appropriate checks are undertaken during and after downloading in accordance with manufacturer's/standard operating procedures.

Assessor guide: confirm that –

The checks to be undertaken during and after downloading can be identified. The reasons for checking that the data transfer is accurate and complete can be given. The action to be taken if data transfer is inaccurate and/or incomplete can be identified.

Element 10.4A.2 Verify machine/system/process operation

Criteria 10.4A.2.1

Appropriate checks undertaken after downloading to ensure machine operation or process output is accurate to specification.

Assessor guide: observe that –

The machine operation or process output is verified for accuracy and conformance to specifications in accordance with manufacturer's/standard operating procedures.

Assessor guide: confirm that –

The specifications relating to the transferred data can be identified. The correct operation of the machine or process can be identified.

Criteria 10.4A.2.2

Specific problems in machine operation or process output being controlled by the programmable controller are identified in accordance with standard operating procedures

Assessor guide: observe that –

Specific problems in machine operation or process output being controlled by the programmable controller can be identified in accordance with standard operating procedures.

Assessor guide: confirm that –

Specific machine operations or process outputs being controlled by the programmable controller are understood and specific problems can be identified in accordance with standard operating procedures.

Criteria 10.4A.2.3

Specific changes required to operating parameters within the software program are derived in accordance with standard operating procedure.

Assessor guide: observe that –

Specific changes required to operating parameters within the software program can be derived in accordance with standard operating procedure.

Assessor guide: confirm that –

Operating parameters within the software program are understood and specific changes required to correct problems can be derived in accordance with standard operating procedure.

Criteria 10.4A.2.4

Adjustments/changes made to operating parameters in accordance with standard operating procedures.

Assessor guide: observe that –

Adjustments/changes are made to operating parameters in accordance with standard operating procedures

Assessor guide: confirm that –

Standard operating procedures are understood and all adjustments/changes to operating parameters are made accordingly.

Criteria 10.4A.2.5

Final check of machine operation or process output taken to ensure that these are in accordance with specifications.

Assessor guide: observe that –

Final check of machine operation or process output is taken to ensure that these are in accordance with specifications.

Assessor guide: confirm that –

The required specification to be met and functions to be controlled can be identified and machine operation or process output are verified in a final check.

Element 10.4A.3 Report on changes**Criteria 10.4A.3.1**

Changes and adjustments reported in accordance with standard operating procedures.

Assessor guide: observe that –

The report is made to standard operating procedures.

Assessor guide: confirm that –

Reporting process is known and understood.

Criteria 10.4A.3.2 Specific problems in machine operation or process output being controlled by the programmable controller are identified in accordance with standard operating procedures.	<i>Assessor guide: observe that –</i> Methodical procedure used to identify problems.	<i>Assessor guide: confirm that –</i> Methodical approach can meet a variety of situations.
Criteria 10.4A.3.3 Specific changes required to operating parameters within the software program are derived in accordance with standard operating procedures.	<i>Assessor guide: observe that –</i> Relevant and appropriate changes are made.	<i>Assessor guide: confirm that –</i> Procedures to change parameters and their implications are understood.
Criteria 10.4A.3.4 Adjustments/changes made to operating parameters in accordance with standard operating procedures.	<i>Assessor guide: observe that –</i> Changes made in accordance with standard operating procedures.	<i>Assessor guide: confirm that –</i>
Criteria 10.4A.3.5 Final check of machine operation or process output taken to ensure that these are in accordance with specifications.	<i>Assessor guide: observe that –</i> Evidence that checks are carried out is present.	<i>Assessor guide: confirm that –</i> Reasons for checks understood.

Range statement

Work undertaken autonomously or as part of team environment using predetermined standards of quality, safety and work place procedures. Work generally undertaken at location of programmable controller* but could be undertaken with data link off-site. Operational parameters include timer, counter and set point settings. All specifications and procedures gained from a range of circuit drawings, engineering data sheets, step print out, manufacturer's procedure and data books. Program languages may include ladder diagram, functional block diagram, instruction lists etc. All work and work practices undertaken to regulatory and legislative requirements. For routine downloading of PLC, CNC or NC programs from disk, tape or direct means not requiring program or data adjustment or checks against specification, see Unit 2.9C10 (Perform computer operations). Verification of machine /process/system operation includes interpreting the program, excluding multi-loop and control sequencing programs. *Programmable controllers include PLC and DCS or similar devices.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the installation and verification of programmable controller programs or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 10.5A A Commission programmable controller programs

Band – Specialisation band A

Field – Installation & commissioning

Unit Weight 4

Pre-requisite units - Path 1

2.9C10 Perform computer operations

9.2A Interpret technical drawing

10.4A Enter and change programmable controller operational parameters

Element 10.5A.1 Commission programmable controller program

Criteria 10.5A.1.1

Program format and operational intent determined and understood.

Assessor guide: observe that –

All relevant circuit drawings, ladder diagrams, engineering data sheets, manufacturer's procedures and data sheets are obtained in accordance with workplace procedures.

Assessor guide: confirm that –

The intended operation of the program can be identified. The format of the program can be identified.

Criteria 10.5A.1.2

Program instructions checked for compliance with specifications using appropriate techniques.

Assessor guide: observe that –

The program instructions are checked for compliance with specifications using appropriate techniques in accordance with manufacturer's/standard operating procedures.

Assessor guide: confirm that –

The program specifications can be identified. The procedures and techniques for checking that program instructions comply with specifications can be identified. The procedures for dealing with any non-conformances with specifications can be identified.

Criteria 10.5A.1.3

Software timers, counter set to specifications where required.

Assessor guide: observe that –

Where appropriate, software timers and/or counters are set to specifications in accordance with manufacturer's/standard operating procedures.

Assessor guide: confirm that –

The procedures for setting software timers and counters can be identified. The function of software timers and counters can be explained.

Criteria 10.5A.1.4

Program stepped through manually and outputs checked and measured for compliance with specifications.

Assessor guide: observe that –

The program is stepped through manually and all outputs checked for conformance to specifications in accordance with manufacturer's/standard operating procedures.

Assessor guide: confirm that –

The procedures for manually stepping through the program can be identified. The checks that can be made of program outputs can be identified. The techniques to be used in checking program outputs can be identified. The measurements to be taken during the checking of program outputs can be identified. The instruments to be used to take those measurements can be identified.

Criteria 10.5A.1.5

Where applicable edit program to meet specifications.

Assessor guide: observe that –

Where appropriate, the program is edited to ensure conformance to specifications in accordance with manufacturer's/standard operating procedures.

Assessor guide: confirm that –

The procedures for editing programs can be identified.

Criteria 10.5A.1.6

External inputs checked for compliance with specifications utilising correct and appropriate techniques.

Assessor guide: observe that –

The external inputs are checked for compliance with specifications using appropriate techniques and equipment in accordance with manufacturer's/standard operating procedures.

Assessor guide: confirm that –

The external inputs can be identified. The checks to be made to ensure that the external inputs comply with specifications can be identified. The techniques and equipment to be used in undertaking those checks can be identified.

Criteria 10.5A.1.7

Where applicable, program is run and total operation checked for compliance with specifications.

Assessor guide: observe that –

Where appropriate, the program is run in conformance with the manufacturer's/standard operating procedures. Where appropriate, the operation of the processes being controlled is checked for conformance to specifications in accordance with manufacturer's/standard operating procedures.

Assessor guide: confirm that –

The procedures for running the program can be identified. The operational processes controlled by the programmable logic controller can be identified. The specifications of the operational process can be identified. Where appropriate, the techniques and equipment to be used to check the operational process for conformance to specifications can be identified.

Criteria 10.5A.1.8

Where applicable, final adjustments undertaken to meet operational specifications using standard operational procedures.

Assessor guide: observe that –

Where appropriate, the program is adjusted to ensure conformance to operational specifications in accordance with manufacturer's/standard operating procedures.

Assessor guide: confirm that –

The adjustments that can be made to the program can be identified. The effects of those adjustments on the operational processes controlled by the program can be explained. The procedures to be followed when adjusting programs can be given.

Range statement

Work undertaken autonomously or as part of team environment using predetermined standards of quality, safety and work place procedures. Work undertaken on location. This unit relates to the adjustment and commissioning of the programmable controller program to specification only. All programmable controller programs include single and multi-loop programs and control sequencing of processes. All specifications and procedures gained from circuit drawings, ladder diagrams, engineering data sheets, program print-out manufacturer's procedures and data books. All work and work practices undertaken to regulatory and legislative requirements. It is assumed that this unit will normally be accessed in conjunction with units of skill that relate to the operational processes controlled by the programmable controller. Programmable controllers include PLC and DCS or similar devices.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies cover by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the installation and verification of programmable controller programs or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 10.6A A Install machine/plant

Band – Specialisation band A

Field – Installation & commissioning

Unit Weight 4

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices

18.1A Use hand tools

18.6A Dismantle/repair/replace/assemble and fit engineering components

9.1A Draw and interpret sketch

18.2A Use power tools/hand held operations

18.9A Levelling and alignment of machines and engineering components

9.2A Interpret technical drawing

18.3A Use tools for precision work

18.55A Dismantle, replace and assemble engineering components

Element 10.6A.1 Inspect and prepare installation site

Criteria 10.6A.1.1

Site checked for correct location, dimension and levels etc utilising appropriate measuring equipment.

Assessor guide: observe that –

All relevant drawings, specifications and instructions are obtained in accordance with workplace procedures. The site is checked for correct location, dimensions and where appropriate levels, in accordance with standard operating procedures.

Assessor guide: confirm that –

The work to be undertaken can be identified. The location, dimensions and levels applicable to the work to be undertaken can be identified. Where appropriate, the technique/equipment to be used to check the site levels can be identified.

Criteria 10.6A.1.2

Non-compliance with specification reported to appropriate authority.

Assessor guide: observe that –

Where appropriate, any non-compliances with specifications detected are reported to the appropriate authority in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures to be followed if the location, dimensions and/or levels of the site do not comply with the specifications can be given. The appropriate authority to which non-compliances are to be reported can be given. The specification of the machine/plant can be identified. The procedures for checking the machine/plant can be given.

Criteria 10.6A.1.3

Alteration, correction undertaken with approval of appropriate authority.

Assessor guide: observe that –

Where appropriate, authorised alterations, corrections or adjustments are made to the site and/or machine/plant in accordance with standard operating procedures.

Assessor guide: confirm that –

Any alterations, corrections or adjustments to be made to the site can be identified. Any alterations, corrections or adjustments to be made to the machine/plant can be identified. The appropriate authority to approve alterations, corrections or adjustments to the site and/or machine/plant can be identified. Approval for any alterations, corrections or adjustments to be made has been received from the appropriate authority.

Criteria 10.6A.1.4

All surfaces, materials and components prepared for use.

Assessor guide: observe that –

Where appropriate, surfaces, materials and/or components are prepared for use in accordance with specifications and standard operating procedures.

Assessor guide: confirm that –

The material and components to be used in the installation of the machine/plant can be identified. Any preparation of surfaces required prior to commencing the installation of the machine/plant can be identified.

Element 10.6A.2 Install machine/plant**Criteria 10.6A.2.1**

All work carried out safely and in accordance with site procedures and to Australian Standards.

Assessor guide: observe that –

All work is carried out safely to specification and in accordance with codes, standards and standard operating procedures.

Assessor guide: confirm that –

The safety procedures to be followed while undertaking the work can be identified. All safety equipment and personal protective clothing to be used/worn while undertaking the work can be identified. All relevant codes and standards can be identified.

Criteria 10.6A.2.2

Machine components prepared for correct sequential installation.

Assessor guide: observe that –

All components of the machine/plant are prepared for correct sequential installation in accordance with standard operating procedures.

Assessor guide: confirm that –

The sequence in which components of the machine/plant are to be installed can be identified.

Criteria 10.6A.2.3

Machine/plant installed in accordance with manufacturer's and site specifications.

Assessor guide: observe that –

All components of the machine/plant are installed and fixed in conformance to specifications and in accordance with standard operating procedures.

Assessor guide: confirm that –

The methods of fixing/fastening the components of the machine/plant can be identified. The methods of lifting/moving the components of the machine/plant can be identified. The methods of locating/holding the components of the machine/plant prior to fixing/fastening can be identified. The reasons for selecting the chosen methods of lifting/moving and locating/holding the components of the machine/plant can be given.

Criteria 10.6A.2.4

Routine modifications/alterations undertaken to standard operating procedures where required.

Assessor guide: observe that –

The machine/plant is checked for conformance to specifications in accordance with standard operating procedures. Where appropriate, the approved adjustments are made to the machine/plant in accordance with specifications and standard operating procedures.

Assessor guide: confirm that –

The procedures to be followed if the machine/plant installation does not comply with the specifications can be identified. The authority to whom non-conformances are to be reported can be identified. The procedures for checking the machine/plant for conformance to specification can be given. Where appropriate, adjustments to be made to bring the machine/plant into specification can be identified. The appropriate authority to approve adjustments to the machine/plant can be identified. Approval for any adjustments to be made has been received from the appropriate authority.

Criteria 10.6A.2.5

Machine/plant levelled, aligned, coupled and connected (excluding electrical connections) in accordance with specifications.

Assessor guide: observe that –

Where appropriate, the machine/plant is levelled, aligned, coupled and connected (excluding electrical connections) to specification in accordance with manufacturer's/standard operating procedures. Where appropriate, any electrical connections are scheduled with the appropriate persons in accordance with standard operating procedures.

Assessor guide: confirm that –

All connections and couplings to be made to the machine/plant can be identified. The levelling and alignment requirements of the machine/plant can be identified. Where appropriate, the person(s) responsible for making any electrical connections can be identified.

Criteria 10.6A.2.6

Site cleaned and cleared of all debris and left in safe state.

Assessor guide: observe that –

The installation site is cleared of all debris, cleaned and left in a safe state in accordance with OH and S requirements and standard operating procedures.

Assessor guide: confirm that –

The requirements for cleaning and clearing the installation site can be identified. Where appropriate, the equipment required to clean and/or clear the site can be identified.

Criteria 10.6A.2.7

All reports, documentation completed correctly to required specifications.

Assessor guide: observe that –

All required reports and documentation are completed correctly and in accordance with standard operating procedures.

Assessor guide: confirm that –

The reports and/or documentation to be completed before, during and after the installation of the machine/plant can be identified.

Range statement

Work generally undertaken in team environment, (but not exclusively). This unit applies to installation where the equipment being installed requires substantial modification to the existing site and/or connecting equipment and excludes minor modifications. Installation covered by this unit also excludes electrical installation. Where existing machines/plant are replaced by the same or similar machine/plant, Unit 18.6A (Dismantle/repair/replace/assemble and fit engineering components) applies. Machine/plant includes rotating equipment and machinery such as pumps, compressors, drive units, blowers, etc; production equipment and plant, process equipment, plant and machinery, engineering plant and machine tools etc. Work undertaken utilising new or existing external and internal locations and sites. Foundations, footings, beds and frameworks completed prior to installation and commissioning. All specifications applied via engineering drawings, written or verbal instructions. All work and work practices undertaken to regulatory and legislative requirements. Routine modifications and alterations are of a minor nature not requiring specification changes or technical recording. Examples would be fitting of spacers, spool pieces, relocation of brackets, alignment of holes etc. If balancing skills or manufacture of gaskets are required, these should be accessed from appropriate units. Where design skills are required refer to Unit 9.11A (Apply basic engineering design concepts).

Evidence guide

Assessment context

This unit should be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the installation of machines and/or plant, or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 10.7B B Modification of control systems

Band – Specialisation band B

Field – Installation & commissioning

Unit Weight 6

This unit covers the competencies required to plan the commissioning procedure, assess the control system performance, adjust the control system, and undertake commissioning modifications. Control loop/system components incorporate all instruments and devices that make up or control a loop/system including sensing devices, control devices, actuator and transducers. Control systems can mean closed or open loop or continuous or step processes. Loops/systems can incorporate the use of pneumatics, hydraulics, electrical/electronics or a combination of these.

Pre-requisite units - Path 1

9.1A Draw and interpret sketch
 10.3A Install and test electrical wiring and circuits (up to 1000vAC/1500vDC)
 18.1A Use hand tools
 18.49A Disconnect/reconnect fixed wired equipment which use up to 1000vAC/1500vDC

9.2A Interpret technical drawing
 12.2A Electrical/electronic measurement
 18.2A Use power tools/hand held operations
 18.51A Fault find repair/rectify complex electrical circuits

10.2A Terminate and connect electrical wiring
 12.4A Precision electrical/electronic measurement
 18.48A Fault find and repair/rectify basic electrical circuits

Pre-requisite units - Path 2

2.2C11 Organise and analyse information
 2.7C10 Perform computations - basic
 2.14C5 Use graphical techniques and perform simple statistical computations

2.5C11 Measure with graduated devices
 2.8C10 Perform computations
 9.1A Draw and interpret sketch

2.6C10 Plan a complete activity
 2.10C5 Write reports
 9.2A Interpret technical drawing

12.2A Electrical/electronic measurement
 18.2A Use power tools/hand held operations

12.3A Precision mechanical measurement
 18.3A Use tools for precision work

18.1A Use hand tools
 18.6A Dismantle/repair/replace/assemble and fit engineering components

18.10A Equipment condition monitoring and recording
 18.19A Maintain and repair pneumatic systems
 18.22A Maintain/repair/replace fluid power controls
 18.55A Dismantle, replace and assemble engineering components

18.16B Analyse plant and equipment condition monitoring results
 18.20A Maintain hydraulic system components
 18.23B Modify fluid power system operation

18.18A Maintain pneumatic system components
 18.21A Maintain and repair hydraulic systems
 18.53B Modify fluid power control systems

Pre-requisite units - Path 3

2.5C11 Measure with graduated devices
 9.2A Interpret technical drawing
 18.2A Use power tools/hand held operations

5.1A Manual soldering/desoldering - electrical/electronic components
 12.4A Precision electrical/electronic measurement
 18.54A Fault find, test, calibrate instrumentation systems, equipment

9.1A Draw and interpret sketch
 18.1A Use hand tools
 18.55A Dismantle, replace and assemble engineering components

18.57A Maintain/service analog/digital electronic equipment	18.60A Maintain, repair control instrumentation - single & multiple loop control systems	18.62A Install, maintain and calibrate instrumentation sensors, transmitters and final control elements
18.67A Tune control loops - multi controller or multi element systems		
Pre-requisite units - Path 4		
2.5C11 Measure with graduated devices	5.1A Manual soldering/desoldering - electrical/electronic components	5.2A High reliability soldering and desoldering
9.1A Draw and interpret sketch	9.2A Interpret technical drawing	12.4A Precision electrical/electronic measurement
18.1A Use hand tools	18.2A Use power tools/hand held operations	18.56A Diagnose and repair analog equipment and components
18.57A Maintain/service analog/digital electronic equipment	18.58A Modify electronic equipment	18.59B Modify electronic systems
18.65A Diagnose and repair digital equipment and components		
Pre-requisite units - Path 5		
2.5C11 Measure with graduated devices	9.2A Interpret technical drawing	12.2A Electrical/electronic measurement
18.1A Use hand tools	18.2A Use power tools/hand held operations	18.55A Dismantle, replace and assemble engineering components
18.86A Test, evacuate and charge refrigeration systems	18.88A Maintain and repair commercial air conditioning systems and components	18.92A Maintain and repair commercial and/or industrial refrigeration and/or air conditioning controls
Pre-requisite units - Path 6		
2.5C11 Measure with graduated devices	9.2A Interpret technical drawing	12.2A Electrical/electronic measurement
18.1A Use hand tools	18.2A Use power tools/hand held operations	18.55A Dismantle, replace and assemble engineering components
18.86A Test, evacuate and charge refrigeration systems	18.90A Maintain and repair industrial refrigeration systems and components	18.92A Maintain and repair commercial and/or industrial refrigeration and/or air conditioning controls
Pre-requisite units - Path 7		
2.5C11 Measure with graduated devices	9.2A Interpret technical drawing	12.2A Electrical/electronic measurement
18.1A Use hand tools	18.2A Use power tools/hand held operations	18.55A Dismantle, replace and assemble engineering components
18.86A Test, evacuate and charge refrigeration systems	18.89A Maintain and repair large central air handling systems	18.90A Maintain and repair industrial refrigeration systems and components
18.93B Maintain and repair integrated industrial refrigeration and/or large air handling system controls		
Pre-requisite units - Path 8		
2.5C11 Measure with graduated devices	9.1A Draw and interpret sketch	9.2A Interpret technical drawing
12.2A Electrical/electronic measurement	18.1A Use hand tools	18.2A Use power tools/hand held operations

18.54A Fault find, test, calibrate instrumentation systems, equipment
 18.62A Install, maintain and calibrate instrumentation sensors, transmitters and final control elements

18.55A Dismantle, replace and assemble engineering components
 18.64A Maintain instrumentation system components

18.60A Maintain, repair control instrumentation - single & multiple loop control systems
 18.67A Tune control loops - multi controller or multi element systems

Element 10.7B.1 Plan commissioning procedure

Criteria 10.7B.1.1

Control system format and operational intent determined and understood

Assessor guide: observe that –
 All relevant drawings, circuits, specifications, data sheets and instructions obtained in accordance with workplace procedures All necessary approvals for the work are obtained in accordance with work place procedures

Assessor guide: confirm that –
 The work to be undertaken can be identified The control system format can be identified The operational intent of the processes being controlled by the control system can be identified The specifications of the control system and the processes being controlled can be identified Any regulatory and legislative requirements associated with the commissioning procedure can be identified

Criteria 10.7B.1.2

Commissioning procedures are effectively sequenced to meet requirement of components and control application

Assessor guide: observe that –

Assessor guide: confirm that –
 The procedures for commissioning the control system can be identified The sequential requirements of the components of the systems being controlled can be identified The commissioning procedures are effectively sequenced to meet the requirements of the system components and the control application The reasons for selecting the chosen commissioning sequence can be

explained

Element 10.7B.2 Check control system installation

Criteria 10.7B.2.1

Verify that all system components are installed correctly to specifications

Assessor guide: observe that –
 All system components are checked for correct installation in conformance to specifications using standard operating procedures

Assessor guide: confirm that –
 All components of the operational processes can be identified The installation specifications for each component of the operational processes can be identified Any measurements to be taken to ensure conformance to specifications can be identified The measuring techniques and equipment appropriate to the measurements to be taken can be identified

Criteria 10.7B.2.2

Appropriate test equipment is functional and calibrated before use

Assessor guide: observe that –
 All test equipment to be used is checked for correct function and is calibrated before use in accordance with standard operating procedures

Assessor guide: confirm that –
 Test equipment and techniques appropriate to the commissioning of the control system can be identified The reasons for selecting the chosen test equipment and techniques can be explained The calibration procedures for the selected test equipment can be identified

Criteria 10.7B.2.3

Components or control loop/system powered up and checked for correct supply in accordance with specifications

Assessor guide: observe that –

The components and/or the control loop/system are energised and checked for correct supply in accordance with specifications and standard operating procedures

Assessor guide: confirm that –

The procedures for energising components and/or the control loop/ system can be identified The supply requirements of components and the control loop/system can be identified

Criteria 10.7B.2.4

All readings/measurements are correctly obtained, interpreted and recorded

Assessor guide: observe that –

All readings/measurements are correctly obtained, interpreted and recorded in accordance with standard operating procedures

Assessor guide: confirm that –

The recording requirements for readings/measurements taken can be identified

Element 10.7B.3 Adjust control system and assess performance**Criteria 10.7B.3.1**

Control loop/system components adjusted to meet control characteristics, application and process specifications utilising appropriate techniques

Assessor guide: observe that –

Where appropriate the control loop/ system components are adjusted in accordance with standard operating procedures to ensure that control characteristics, application and process specifications are achieved

Assessor guide: confirm that –

The adjustments that can be made to the control loop/system components can be identified The effects of those adjustments on the control characteristics and operational processes can be explained

Criteria 10.7B.3.2

Final verifications including any operational adjustments made to ensure required performance

Assessor guide: observe that –

The appropriate measurements/tests are undertaken in accordance with standard operating procedures to ensure the control system and process operation conforms to specification

Assessor guide: confirm that –

The appropriate measurements/tests to be undertaken to verify control system and process operation can be identified The reasons for selecting the chosen measurements/tests can be explained

Element 10.7B.4 Commissioning modifications undertaken**Criteria 10.7B.4.1**

Necessary modifications to change performance in order to meet manufacturer's or operational specifications or safety and legislative requirements are undertaken or actioned

Assessor guide: observe that –

Where appropriate, the authorised modification to the control system and/or process components carried out in accordance with standard operating procedures

Assessor guide: confirm that –

The procedures to be followed if the operational specifications of the control system and/or process cannot be achieved can be identified The effect of changes to control system components on system performance can be explained The appropriate authority to approve any modifications to the control system and/or process components can be given Where appropriate, the relevant authority has approved any modification to be undertaken

Criteria 10.7B.4.2

Provide reports on system/process characteristics for warranty, handover, legislative, etc. purposes

Assessor guide: observe that –

All relevant reports on the commissioning of the control system are completed in accordance with standard operating procedures

Assessor guide: confirm that –

The reporting requirements associated with the commissioning of control systems can be identified

Criteria 10.7B.4.3

All modifications documented and result recorded to standard operating procedure

Assessor guide: observe that –

Where appropriate, all relevant reports on the modifications made to the control system and/or process components are completed in accordance with standard operating procedures

Assessor guide: confirm that –

The requirements for recording modifications to control systems and/or process components can be identified The reasons for recording modifications to control systems and/or process components can be identified

Range statement

Work generally undertaken in a team environment, but not exclusively. Commissioning involves the development of a commissioning procedure, testing of operation and adjustment to conform with specification. Control loop/system components incorporate all instruments and devices which make up or control a loop/system, including sensing devices, control devices, actuators and transducers. Control systems can mean closed or open loop on continuous or step process control systems. Loop/system control can incorporate the use of pneumatics, electrical, electronics, hydraulics or a combination. All specifications supplied via engineering/circuit drawings, data sheets, written or verbal instructions. All work and work practices undertaken to regulatory and legislative requirements.

Evidence guide**Assessment context**

This unit should be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the commissioning and modification of control systems or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 10.8B A Undertake commissioning procedures for plant and/or equipment

Band – Specialisation band B

Field – Installation & commissioning

Unit Weight 4

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices
10.6A Install machine/plant
18.3A Use tools for precision work

9.1A Draw and interpret sketch
18.1A Use hand tools
18.6A Dismantle/repair/replace/assemble and fit engineering components

9.2A Interpret technical drawing
18.2A Use power tools/hand held operations
18.9A Levelling and alignment of machines and engineering components

18.55A Dismantle, replace and assemble engineering components

Pre-requisite units - Path 2

2.5C11 Measure with graduated devices
18.1A Use hand tools

9.2A Interpret technical drawing
18.2A Use power tools/hand held operations

12.2A Electrical/electronic measurement
18.55A Dismantle, replace and assemble engineering components

18.86A Test, evacuate and charge refrigeration systems

18.90A Maintain and repair industrial refrigeration systems and components

Pre-requisite units - Path 3

2.5C11 Measure with graduated devices
18.1A Use hand tools

9.2A Interpret technical drawing
18.2A Use power tools/hand held operations

12.2A Electrical/electronic measurement
18.55A Dismantle, replace and assemble engineering components

18.89A Maintain and repair large central air handling systems

Pre-requisite units - Path 4

2.5C11 Measure with graduated devices
10.2A Terminate and connect electrical wiring

9.1A Draw and interpret sketch
10.3A Install and test electrical wiring and circuits (up to 1000vAC/1500vDC)

9.2A Interpret technical drawing
12.2A Electrical/electronic measurement

18.1A Use hand tools

18.2A Use power tools/hand held operations

18.49A Disconnect/reconnect fixed wired equipment which use up to 1000vAC/1500vDC

18.55A Dismantle, replace and assemble engineering components

Element 10.8B.1 Plan commissioning procedure

Criteria 10.8B.1.1

Commissioning procedure is undertaken and approvals obtained in accordance with standard operating procedures.

Assessor guide: observe that –

The appropriate sequence of events in the commissioning of the machine/plant can be identified.

Assessor guide: confirm that –

All necessary approvals for the work are obtained in accordance with site procedures. All procedures documentation pertaining to the commissioning procedures is obtained in accordance with work site procedures.

Element 10.8B.2 Assess system performance**Criteria 10.8B.2.1**

Correct measuring/test devices used.

Assessor guide: observe that –

The performance tests appropriate to the machine/plant to be commissioned can be identified.

Assessor guide: confirm that –

Appropriate measuring/testing devices are selected in accordance with work site procedures and machine/plant specifications.

Criteria 10.8B.2.2

All necessary measurements/readings taken at appropriate points.

Assessor guide: observe that –

The measurements to be taken to ensure conformance to specifications can be identified. The correct points at which measurements are to be taken can be identified.

Assessor guide: confirm that –

All measurements/readings are safely taken in accordance with work site procedures.

Criteria 10.8B.2.3

All variances from specifications recorded to standard operating procedure.

Assessor guide: observe that –

All variations from specification can be identified. The reasons for detected variations from performance specifications can be given.

Assessor guide: confirm that –

Variations in machine/plant performance from specification are recorded in accordance with work site procedures.

Element 10.8B.3 Adjust plant**Criteria 10.8B.3.1**

Plant/system performance adjusted to design and operational specifications utilising appropriate and correct techniques. Technical difficulties are resolved in consultation with appropriate technical advisors.

Assessor guide: observe that –

Appropriate adjustments to bring the machine/plant into line with operational specifications can be identified based on engineering principles or appropriate technical advice.

Assessor guide: confirm that –

Appropriate adjustments are made to the machine/plant to bring it into specification in accordance with work site procedures.

Element 10.8B.4 Make reports

Criteria 10.8B.4.1

Produce report/logs on completed system/plant/machinery/status/ performance as required in accordance with standard operating procedures.

Assessor guide: observe that –

The reporting requirements relevant to the machine/plant being commissioned can be identified.

Assessor guide: confirm that –

All appropriate reports in accordance with standard operating procedures.

Range statement

Work generally undertaken as part of team role. Technical difficulties are resolved in consultation with appropriate technical advisors. Plant and/or equipment includes rotating equipment and machinery, production equipment, plant and machinery, process equipment, and machine tools etc. Commissioning work, which may be of an electrical/electronic/mechanical nature, is undertaken on internally or externally located plant and/or equipment that is new, or replacement, or has been extensively modified (by people usually outside of the commissioning individual or team). This unit is not intended to be used by electrical/electronic/mechanical maintenance personnel completing their own work, including return to service work. These activities are covered in Unit 18.4A (Maintain and overhaul mechanical equipment and/or Unit 9.11A (Apply basic engineering design concepts) and/or Unit 18.6A (Dismantle/repair/replace/assemble and fit engineering components) and/or 18.48A (Fault find repair/rectify basic circuits) and/or 18.54A (Fault find test calibrate instrumentation, sensors, transmitters and final control elements). All work undertaken to specifications supplied via engineering drawings and data sheets, written and verbal instructions, regulatory and legislative requirements. Additional specialisation units may be required for some specialist applications eg: fluid power, instrumentation and PLC, electrical/electronic etc.

Evidence guide

Assessment context

This unit should be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant drawings, manuals, catalogues, codes, standards, regulations and reference material relevant to the work. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the commissioning of machines and plant, or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Special notes

During assessment, the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities.

Unit MEM 10.9A A Install refrigeration and air conditioning plant and equipment

Band – Specialisation band A

Field – Installation & commissioning

Unit Weight 4

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices

10.10A Install pipework and pipework assemblies

18.55A Dismantle, replace and assemble engineering components

9.1A Draw and interpret sketch

18.1A Use hand tools

18.86A Test, evacuate and charge refrigeration systems

9.2A Interpret technical drawing

18.2A Use power tools/hand held operations

Element 10.9A.1 Inspect and prepare installation site

Criteria 10.9A.1.1

Site checked for correct location, dimension and levels, etc. utilising appropriate measuring equipment.

Assessor guide: observe that –

All relevant drawings, specifications and instructions are obtained with workplace procedures. The site is checked for correct location, dimensions and where appropriate, levels, in accordance with standard operating procedures.

Assessor guide: confirm that –

The work to be undertaken can be identified. The location, dimensions and levels applicable to the work to be undertaken can be identified. Where appropriate, the technique/equipment to be used to check the site levels can be identified.

Criteria 10.9A.1.2

Non-compliance with specification reported to appropriate authority.

Assessor guide: observe that –

Where appropriate, any non-compliance to specifications detected are reported to the appropriate authority in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures to be followed if the location, dimensions and/or levels of the site do not comply with the specifications can be given. The appropriate authority to which non-compliances are to be reported can be given. The specification of the refrigeration/air conditioning plant and equipment can be identified. The procedures for checking the refrigeration/air conditioning plant and equipment can be given.

Criteria 10.9A.1.3

Alteration, correction undertaken with approval of appropriate authority.

Assessor guide: observe that –

Where appropriate, authorised alterations, corrections or adjustments are made to the site and/or refrigeration/air conditioning plant and equipment in accordance with standard operating procedures.

Assessor guide: confirm that –

Any alterations, corrections or adjustments to be made to the site can be identified. Any alterations, corrections or adjustments to be made to the refrigeration/air conditioning plant and equipment can be identified. The appropriate authority to approve alterations, corrections or adjustments to the site and/or structure can be identified. Approval for any alterations, corrections or adjustments to be made has been received from the appropriate authority.

Criteria 10.9A.1.4

All surfaces, materials and components prepared for use.

Assessor guide: observe that –

Where appropriate, surfaces, materials and/or components are prepared or use in accordance with specifications and standard operating procedures.

Assessor guide: confirm that –

The materials and components to be used in the installation of the refrigeration/air conditioning plant and equipment can be identified. Any preparation of surfaces required prior to commencing the installation of the refrigeration/air conditioning plant and equipment can be identified.

Element 10.9A.2 Install refrigeration/air conditioning plant and equipment**Criteria 10.9A.2.1**

All work carried out safely and in accordance with site procedures and to Australian Standards.

Assessor guide: observe that –

All work is carried out safely to specification and in accordance with all relevant codes, standards and standard operating procedures.

Assessor guide: confirm that –

The safety procedures to be followed while undertaking the work can be identified. All safety equipment and personal protective clothing to be used/worn while undertaking the work can be identified. All relevant codes and standards can be identified.

Criteria 10.9A.2.2

Refrigeration/air conditioning plant and equipment/components are prepared for correct sequential installation.

Assessor guide: observe that –

All components of the refrigeration/air conditioning plant are prepared for correct sequential installation in accordance with standard operating procedures.

Assessor guide: confirm that –

The sequence in which components of the refrigeration/air conditioning plant are to be installed can be identified. The reasons for selecting the chosen installation sequence can be explained.

Criteria 10.9A.2.3

Refrigeration/air conditioning plant and equipment/components are installed in conformance with manufacturers' and site specification.

Assessor guide: observe that –

All components of the refrigeration/air conditioning plant are installed and fixed in conformance to specifications and in accordance with standard operating procedures.

Assessor guide: confirm that –

The methods of fixing/fastening the components of the refrigeration/air conditioning plant can be identified. The methods of lifting/moving the components of the refrigeration/air conditioning plant can be identified. The methods of locating/holding the components of the refrigeration/air conditioning plant prior to fixing/fastening can be identified. The reasons for selecting the chosen methods of lifting/moving and locating/holding the components of the refrigeration/air conditioning plant can be given.

Criteria 10.9A.2.4

Routine modifications/alterations of the refrigeration/air conditioning plant and equipment are undertaken to standard operating procedures where required.

Assessor guide: observe that –

The refrigeration/air conditioning plant and equipment is checked for conformance to specifications in accordance with standard operating procedures. Where appropriate, the approved modifications/alterations are made to the refrigeration/air conditioning plant and equipment in accordance with specifications and standard operating procedures.

Assessor guide: confirm that –

The procedures to be followed if the refrigeration/air conditioning plant does not comply with the specifications can be identified. The authority to whom non-conformances are to be reported can be identified. The procedures for checking refrigeration/air conditioning plant and equipment for conformance to specifications can be given. Where appropriate, modifications/alterations to be made to bring the refrigeration/air conditioning plant and equipment into specification can be identified. The appropriate authority to approve modifications/alterations to the refrigeration/air conditioning plant and equipment can be identified. Approval for any modifications/alterations to be made has been received from the appropriate authority.

Criteria 10.9A.2.5

Refrigeration/air conditioning plant and equipment levelled, aligned, coupled and connected in accordance with specifications.

Assessor guide: observe that –

Where appropriate, the refrigeration/air conditioning plant and equipment is levelled, aligned, coupled and connected to specification in accordance with manufacturers'/standard operating procedures. Where appropriate, electrical connections are scheduled with the appropriate person(s) in accordance with standard operating procedures. All necessary permits and clearances associated with the connection of services to the refrigeration/air conditioning plant and equipment are obtained in accordance with the relevant legislation and regulations.

Assessor guide: confirm that –

All connections and couplings to be made to the refrigeration/air conditioning plant and equipment can be identified. The levelling and alignment requirements of the refrigeration/air conditioning plant and equipment can be identified. Where appropriate, the person(s) responsible for making electrical connections can be identified. All services to be connected to the refrigeration/air conditioning plant and equipment can be identified. All state/territory regulations and legislation relating to the services to be connected can be identified.

Criteria 10.9A.2.6

The refrigeration system is charged with refrigerant and lubricant in accordance with standard operating procedures.

Assessor guide: observe that –

The refrigeration system is charged with the correct refrigerant, to specifications in accordance with standard operating procedures. The refrigeration system is checked for leaks using appropriate tools, techniques and equipment in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for charging refrigeration systems with refrigerant and lubricants can be given. The procedures for checking refrigeration systems for leaks can be given. The appropriate refrigerant and lubricant can be identified.

Criteria 10.9A.2.7

Site cleaned and cleared of all debris and left in a safe state.

Assessor guide: observe that –

The installation site is cleared of all debris, cleaned and left in a safe state in accordance with occupational health and safety requirements and standard operating procedures.

Assessor guide: confirm that –

The requirements for cleaning and clearing the installation site can be identified. Where appropriate, the equipment required to clean and or clear the site can be identified.

Element 10.9A.3 Start up refrigeration/air conditioning plant and equipment**Criteria 10.9A.3.1**

The refrigeration/air conditioning plant and equipment is started up in accordance with standard operating procedures.

Assessor guide: observe that –

Pre-start checks are undertaken in accordance with standard operating procedures. The refrigeration/air conditioning plant and equipment is started up safely and correctly in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for checking refrigeration/air conditioning plant and equipment prior to start-up can be given. The reasons for carrying out pre-start checks can be explained. The safety procedures to be followed when starting up refrigeration/air conditioning plant and equipment can be given. All appropriate safety equipment can be identified and its application given. The procedures for starting the refrigeration/air conditioning plant and equipment can be given. The consequences of not following prescribed start-up procedures can be explained.

Criteria 10.9A.3.2

The refrigeration/air conditioning plant and equipment is operated, monitored and adjusted to specification.

Assessor guide: observe that –

The refrigeration/air conditioning plant and equipment is operated, monitored and adjusted to specification using appropriate tools, techniques and equipment in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for operating the refrigeration/air conditioning plant and equipment can be given. The procedures, tools, techniques and equipment required to monitor the performance of the refrigeration/air conditioning plant and equipment can be identified. The procedures for adjusting the refrigeration/air conditioning plant and equipment to specification can be given.

Criteria 10.9A.3.3

All reports, documentation completed correctly to required specifications.

Assessor guide: observe that –

All reports and documentation are completed correctly and in accordance with standard operating procedures.

Assessor guide: confirm that –

The reports and/or documentation to be completed before, during and after the installation and start-up of refrigeration/air conditioning plant and equipment can be identified.

Range statement

Work is undertaken autonomously or in a team environment using predetermined standards of safety, quality and workshop procedures. Refrigeration/air conditioning systems include commercial, industrial and transport applications - Refer to Field Definitions. Refrigeration/air conditioning components include, but not limited to compressors, evaporators, condensers, valves, controllers, fans, solenoids, sensors, thermostats, switches, recorders, etc. Controls may be mechanical, pneumatic, electric, electronic and may be sequenced/controlled by programmable controllers or computer systems. All work is to be undertaken in accordance with all relevant state or territory legislation and regulatory requirements. Modifications and alterations are of a routine/minor nature and do not require specification changes or technical recording. For example, the fitting of spacers, relocation of brackets, alignment of holes, etc. Work is undertaken utilising new or existing internal or external locations and sites. Footings, foundations, beds and frameworks are completed prior to installation. This unit should not be selected with Unit 10.6A (Install machine/plant), but appropriate air conditioning/refrigeration would still be required where Unit 10.6A (Install machine/plant) is substituted for Unit 10.9A (Install refrigeration and air conditioning plant and equipment). Where any extensive fitting, alignment is required, then Unit 18.6A (Dismantle/repair/replace/assemble and fit engineering components) and Unit 18.9A (Levelling and alignment of machines and engineering components) may also need to be considered. Where modifications involve electrical disconnection and reconnection, then Unit 18.49A (Disconnect/reconnect fixed wired equipment (which use up to 1000vAC/1500vDC)), should also be considered. If brazing/silver soldering skills are required, Unit 5.6A (Perform brazing and/or silver soldering) should also be accessed.

Evidence guide

Assessment context

This unit should be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. Assessment should be conducted in an environment that the individual is familiar with.

Critical aspects

This unit could be assessed in conjunction with other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the installation of refrigeration/air conditioning plant and equipment or other competencies requiring the exercise of the skills and knowledge covered by this unit.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant drawings, manuals, catalogues, codes, standards, regulations and reference material relevant to the work. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment, the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities.

Unit MEM 10.10A A Install pipework and pipework assemblies

Band – Specialisation band A

Field – Installation & commissioning

Unit Weight 4

Pre-requisite units - Path 1

9.1A Draw and interpret sketch

9.2A Interpret technical drawing

18.1A Use hand tools

18.2A Use power tools/hand held operations

Element 10.10A.1 Plan the installation

Criteria 10.10A.1.1

Quantity and type of pipework and pipework assemblies are selected according to specifications.

Assessor guide: observe that –
Appropriate specifications are obtained.

Assessor guide: confirm that –
Specifications are interpreted to select correct types and quantities.

Criteria 10.10A.1.2

Appropriate sequence for the installation of pipework and pipework assemblies determined.

Assessor guide: observe that –
Sequence determined with regard to type of installation, site conditions, other structures present, work integrated with other site activities.

Assessor guide: confirm that –
Sequence can be determined for a range of situations, materials and conditions.

Criteria 10.10A.1.3

Work site prepared for installation of pipework and pipework assemblies.

Assessor guide: observe that –
Site is prepared with due regard to OHS including site safety, clear working space, other materials/structures/personnel in vicinity, isolation of work site where required.

Assessor guide: confirm that –
Safety issues can be clearly identified and explained, adequate precautions determined and applied, awareness of other site factors that could be effected by the work.

Element 10.10A.2 Pipework and pipework assemblies prepared for assembly**Criteria 10.10A.2.1**

Pipework is cleaned in accordance with standard operating procedures.

Assessor guide: observe that –

All pipework and assemblies are cleaned to specifications safely, in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for cleaning pipework and assemblies can be given. The solvents/cleaning materials to be used in cleaning the pipework and assemblies can be identified. The reasons for selecting the chosen solvent/cleaning material can be explained. The solvents/cleaning materials to be used on a variety of pipe materials and piping applications can be given. The precautions to be taken when using solvents/cleaning materials can be given.

Criteria 10.10A.2.2

Pipework and assemblies are purged in accordance with standard operating procedures.

Assessor guide: observe that –

Pipework and assemblies are purged safely in accordance with standard operating procedures using appropriate tools, techniques and equipment.

Assessor guide: confirm that –

The reasons for purging pipework and assemblies can be explained. A variety of purging materials and their application can be given. The appropriate purging material for the given pipework and assemblies can be identified. The reasons for selecting the chosen purging material can be given. The precautions to be taken when purging pipework and assemblies can be given. The tools, techniques and equipment required to purge pipework and assemblies can be identified.

Criteria 10.10A.2.3

Pipework and assemblies are capped/sealed.

Assessor guide: observe that –

Pipework and assemblies are capped/sealed to specification in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for capping/sealing pipework and assemblies can be given. The methods of capping/sealing pipework and assemblies can be identified. The reasons for selecting the chosen capping/sealing method can be given. The reasons for capping/sealing pipework and assemblies can be explained.

Element 10.10A.3 Install pipework and assemblies**Criteria 10.10A.3.1**

Enclosures/hangers/support systems are installed without damage or distortion to the surrounding environment or other services.

Assessor guide: observe that –

Appropriate enclosures/hangers/support systems are installed in the correct location, in accordance with standard operating procedures without damage or distortion to the surrounding environment or other services.

Assessor guide: confirm that –

The location/layout of pipework and assemblies can be identified. A variety of enclosures/hangers/ support systems and their application can be given. The method of attachment of the enclosures/hangers/support systems to the surrounding environment can be identified. The precautions to be taken installing enclosures/hangers/support systems can be identified. The procedures to be followed when installing enclosures/hangers/support systems can be given.

Criteria 10.10A.3.2

Pipework and assemblies are installed without damage or distortion to either pipework, assemblies or surrounding environment or other services.

Assessor guide: observe that –

Pipework and assemblies are installed in correct location in accordance with standard operating procedures without damage or distortion to pipework, assemblies, surrounding environment or other services.

Assessor guide: confirm that –

The procedures for installing pipework and assemblies can be given. The method of attachment of the pipework and assemblies to the enclosures/hangers/support systems can be identified. The precautions to be taken when installing pipework and assemblies can be explained.

Criteria 10.10A.3.3

Leak test pipework in accordance with standard operating procedures.

Assessor guide: observe that –

The installed pipework and assemblies are leak tested in accordance with standard operating procedures using appropriate tools, techniques and equipment. The installed pipework and assemblies are free of leaks and conform to specifications.

Assessor guide: confirm that –

The procedures for leak testing pipework and assemblies can be given. The precautions to be taken when leak testing is being carried out can be explained. The tools, techniques and equipment necessary to carry out leak testing of pipework and assemblies can be identified. The operational specification of the system incorporating the installed pipework and assemblies can be identified.

Criteria 10.10A.3.4

All ancillary devices and materials are installed to specification in accordance with standard operating procedures.

Assessor guide: observe that –

All required ancillary devices and materials are installed safely to specification in accordance with standard operating procedures.

Assessor guide: confirm that –

All ancillary devices and materials to be installed in conjunction with the pipework and assemblies can be identified. The procedures for installing ancillary devices and materials can be given. The precautions to be taken when installing ancillary devices and materials can be given.

Range statement

Work is undertaken autonomously or in a team environment using predetermined standards of safety, quality and workshop procedures. Work may be undertaken at the installation site given appropriate facilities and equipment are available or at a remote location. Pipework refers to pipes and tubes made from ferrous and non-ferrous metals and plastics. Piping accessories include flanges, joints, valves, unions, collars, etc. Ancillary components include insulation materials, valve control systems, etc. Enclosures include metal and PVC ducts, etc. Support systems include pipe/tube bundle support, ties, unistrut, trays, ladder racks, etc. Where pipework and assemblies are to be part of a system/process covered by legislative/regulatory requirements, the units relating to the appropriate welding certificates for the pipe material and application must be accessed. Where pipework is to be cut by mechanical or thermal methods, or welding processes used, the appropriate unit(s) should be accessed. Where the pipework is to be formed and shaped using mechanical and/or thermal techniques, Unit 5.10A (Undertake fabrication, forming, bending and shaping), should be accessed.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or a combination of on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team.

Assessment should be conducted in an environment that the individual is familiar with.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Critical aspects

This unit could be assessed in conjunction with other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the installation of pipework and accessories or other competencies requiring the exercise of the skills and knowledge covered by this unit.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities.

Unit MEM 10.11A A Terminate and connect specialist cables

Band – Specialisation band A

Field – Installation & commissioning

Unit Weight 2

Pre-requisite units - Path 1

9.2A Interpret technical drawing

10.2A Terminate and connect electrical wiring

12.2A Electrical/electronic measurement

18.1A Use hand tools

Element 10.11A.1 Prepare for termination and connection of specialist cables

Criteria 10.11A.1.1

All work undertaken safely and to workplace procedures, appropriate regulations and legislative requirements.

Assessor guide: observe that –

All work is undertaken in accordance with work site procedures and relevant statutory requirements.

Assessor guide: confirm that –

Safety hazards associated with the termination and connection of cables, and the work environment, can be identified. Relevant statutory requirements associated with the termination and connection of specialist cables can be identified.

Criteria 10.11A.1.2

Correct cables and materials selected in accordance with job requirements.

Assessor guide: observe that –

Cables and materials are checked for condition and conformance to specifications.

Assessor guide: confirm that –

Appropriate specifications for specialist cables and materials can be identified.

Criteria 10.11A.1.3

Certification documentation obtained where appropriate.

Assessor guide: observe that –

Appropriate documentation, certifying work to be carried out, is obtained.

Assessor guide: confirm that –

Correct and appropriate documentation and approvals are identified.

Criteria 10.11A.1.4

Preparation of work undertaken or checked/inspected for correct locations and specifications.

Assessor guide: observe that –

Where appropriate, new installation site checked for correct location and specifications in accordance with work site procedures. Where appropriate, existing installation inspected for correct location and specifications in accordance with work site procedures.

Assessor guide: confirm that –

The location of the work to be undertaken can be identified. Any wiring support and/or protection requirements can be identified. The specifications of wiring support and/or protection requirements can be identified.

Element 10.11A.2 Connect specialist cables

Criteria 10.11A.2.1

Terminations/connections made to specifications, manufacturers requirements and to safety and state/territory regulations and legislative requirements.

Assessor guide: observe that –

All terminations/connections made to specification and comply with manufacturer's and regulatory requirements.

Assessor guide: confirm that –

The relevant statutory requirements can be identified.
The manufacturers' requirements can be identified.

Criteria 10.11A.2.2

Equipment and wiring are installed in a manner that does not reduce the type of protection afforded by the equipment design.

Assessor guide: observe that –

All installations are undertaken to ensure that the full protection provided by the specialist cable installation is maintained.

Assessor guide: confirm that –

The purpose of the use of the specialist cable installation is identified. The installation meets the manufacturers' requirements.

Criteria 10.11A.2.3

All cabling, connections and terminations are tested for compliance with specifications.

Assessor guide: observe that –

All cabling, connections and terminations tested in accordance with specifications.

Assessor guide: confirm that –

Appropriate tests for specialist cables can be identified.

Criteria 10.11A.2.4

All cables, wires, conductors and connections are marked/tagged and labelled to specifications.

Assessor guide: observe that –

All cables, wires, conductors and connections are marked, tagged and labelled to specification.

Assessor guide: confirm that –

The marking, tagging and labelling requirements for cables, wires, conductors and connections can be identified.

Criteria 10.11A.2.5

All reports, documentation completed correctly in accordance with relevant specifications and regulatory requirements.

Assessor guide: observe that –

All reports/documents completed in accordance with regulatory and work site procedures.

Assessor guide: confirm that –

The data to be recorded/reported and the frequency of recording/reporting can be identified.

Range statement

Specialist cables include, but not confined to

- Mineral insulate cables (MIMS)
- Steel wire (SWA - normally described as Steel Wire Armoured cables)
- Other sheathed cables such as piloted cables, composite screened cables, braided cables
- Cable installations requiring specialised glands, fittings and enclosures

Work undertaken autonomously or as part of a team environment. Work undertaken in the field or workshop environment. Work undertaken in accordance with relevant regulations, legislation and specifications. All testing undertaken on completed circuits where not connected to main supply using appropriate methods eg: continuity and resistance checks. Specifications obtained from electrical/electronic circuit drawings, data sheets and manufacturers' manuals. Special fittings must be used for each type of specialist cable. The cables are often rigid and require the use of bending tools and techniques which do not deform the cable, thus causing damage to the insulation etc. Also compounds such as resins may be required for sealing purposes. Most types of specialist cable are designed to either exclude or minimise the ingress of gas or liquids, or to minimise the danger of flash. Termination and connection therefore requires particular techniques, and, in some cases testing. All specifications and procedures are obtained from circuit drawings, data sheets, instructions and regulatory requirements. All work is to be conducted in accordance with relevant legislative and regulatory requirements. For termination and connection of signal and data cables Unit 18.63A (Terminate signal and data cables) should be selected.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or a combination of on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the termination and connection of specialist cables, or other units requiring the exercise of skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all pre-requisites have been satisfied.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities.

Unit MEM 10.13A A Assemble and install equipment and accessories/ancillaries

Band – Specialisation band A

Field – Installation & commissioning

Unit Weight 2

This unit covers the competencies required for assembling and installing equipment and ancillaries/accessories. It does not cover installation requiring substantial modification to the existing site or where components are replaced by the same or similar, type. Typical applications may include marine vessel manufacture.

Installation

and testing within manufacturer specifications is covered by Unit 25.12A (Install and test operations of marine auxiliary systems).

Pre-requisite units - Path 1

9.2A Interpret technical drawing

18.1A Use hand tools

18.2A Use power tools/hand held operations

Element 10.13A.1 Inspect and prepare the installation site

Criteria 10.13A.1.1

Site checked for location, dimension, levels, etc. utilising appropriate measuring equipment.

Assessor guide: observe that –

Site is checked and dimensions and measurements taken according to job requirements and industry standards.

Assessor guide: confirm that –

Appropriate leveling and measuring equipment can be identified and benefits of choice explained.

Criteria 10.13A.1.2

Non compliance with specification reported to appropriate authority.

Assessor guide: observe that –

Non compliance reported according to procedural standards.

Assessor guide: confirm that –

Procedural standards can be identified. Non compliance and the impact of such can be explained.

Criteria 10.13A.1.3

Alteration, correction undertaken with approval of appropriate authority.

Assessor guide: observe that –

Where required, alterations or corrections undertaken as directed.

Assessor guide: confirm that –

Requirement for adherence to procedures can be stated.

Criteria 10.13A.1.4

All surfaces, materials and components prepared for use.

Assessor guide: observe that –

Surfaces, materials and components prepared for use. Component parts checked against specification where necessary.

Assessor guide: confirm that –

Preparatory requirements and processes can be explained.

Element 10.13A.2 Install machinery/plant and equipment

Criteria 10.13A.2.1

Work carried out safely and in accordance with site procedures, standard operating procedures and legislative requirements.

Assessor guide: observe that –

All work is carried out safely and in accordance with manufacturer's, site and legislative requirements.

Assessor guide: confirm that –

Hazards are identified and safe working procedures can be stated. Legislative requirements can be explained.

Criteria 10.13A.2.2

Machine/equipment components prepared for correct sequential installation.

Assessor guide: observe that –

Machinery/plant or equipment is prepared according to specifications and established procedures.

Assessor guide: confirm that –

All parts can be identified and sequence of installation can be stated.

Criteria 10.13A.2.3

Install machinery/plant or equipment in accordance with manufacturer's and site specifications.

Assessor guide: observe that –

Machinery/plant or equipment is installed in accordance with manufacturer's and site specific requirements.

Assessor guide: confirm that –

Installation procedures can be explained

Criteria 10.13A.2.4

Routine modification/alterations undertaken to operating procedures where required.

Assessor guide: observe that –

Modifications/alterations, where necessary, are carried out to industry standard without jeopardising structural or watertight integrity.

Assessor guide: confirm that –

Reasons for modifications/alterations are identified and impact of modifications/alterations can be stated.

Criteria 10.13A.2.5

Machine/equipment levelled, aligned, connected or coupled where required (excluding electrical connections)

Assessor guide: observe that –

Machine/equipment levelled, aligned, connected or coupled according to specifications. Through hull fittings are packed/sealed to make watertight.

Assessor guide: confirm that –

Procedures for leveling and aligning can be explained. Impacts of mis-allignment can be stated.

Criteria 10.13A.2.6

Site cleaned and cleared of all debris and left in safe state.

Assessor guide: observe that –

Site is cleaned to an acceptable level in terms of safety and cleanliness and all debris removed.

Assessor guide: confirm that –

Cleaning procedures can be identified and hazards stated.

Range statement

Work undertaken autonomously and/or as part of a team where appropriate. Applies to installation to pre-determined positions/locations using drawings, instructions etc. Equipment and accessories/ancillaries may include toe rails, cleats, bollards, bow-rollers, fairleads, staunchions, railings, non-powered and powered winches, engines and driving mechanisms, auxiliary power plants, desalinating units, stabiliser units, , powered/non-powered davits, pumps and compressors etc. Work undertaken utilising new external and internal locations and sites. Foundations, footings, beds and framework completed prior to installation practices. All specifications applied via engineering drawings, written or verbal instructions. All work and work practices undertaken to regulatory and legislative requirements. Where positions are determined, alignments undertaken, testing within manufacturer specifications is required etc. Unit 25.12A (Install and test operations of marine auxiliary systems) should be selected. Where installation requires substantial modification to the existing site, and is being replaced by the same or similar, type Unit 10.6A (Install machine/plant), Unit 18.6A (Dismantle/repair/replace/assemble and fit engineering components), Unit 18.9A (Levelling and alignment of machines and engineering components) and Unit 18.55A (Dismantle, replace and assemble engineering components) should be accessed. For production-related assembly work, Unit 3.2A (Precision assembly) should be selected. Do not select this unit if Unit 3.2A (Precision assembly) has already been selected. Where load shifting equipment such as ride on fork lifts/pallet trucks is used, Unit 11.10A (Operate mobile load shifting equipment) should also be considered.

Evidence guide**Assessment context**

This unit may be assessed on the job, off the job, or a combination of on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the assembly and installation of equipment and accessories/ancillaries or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 11.1A B Erect/dismantle scaffolding and equipment

Band – Specialisation band A

Field – Materials handling

Unit Weight 4

Pre-requisite units - Path 1

18.1A Use hand tools

Element 11.1A.1 Erect scaffold/equipment

Criteria 11.1A.1.1

All work undertaken safely and to prescribed procedures.

Assessor guide: observe that –

All relevant job instructions, specifications and procedures are obtained in accordance with work place procedures. All work is undertaken safely and in accordance with standard operating procedures.

Assessor guide: confirm that –

The work to be undertaken can be identified. The safety procedures to be followed can be identified.

Criteria 11.1A.1.2

Erection site prepared to meet job requirements.

Assessor guide: observe that –

The erection site is prepared in accordance with standard operating procedures.

Assessor guide: confirm that –

The erection site can be identified. The procedures for preparing a site for the erection of scaffolding and equipment can be given.

Criteria 11.1A.1.3

Necessary signage and barriers placed in appropriate position.

Assessor guide: observe that –

All necessary signage and barriers are appropriately placed in accordance with standard operating procedures.

Assessor guide: confirm that –

The signs and barriers to be put in place and their location can be identified. The reasons for placing signs and barriers in appropriate positions can be given.

Criteria 11.1A.1.4

Scaffolding/equipment is erected to plan and in accordance with acceptable safe work practices, Australian Standards and equipment manufacturer's requirements.

Assessor guide: observe that –

The scaffolding/equipment is erected in the planned sequence and in accordance with relevant codes, standards, regulations and manufacturer's requirements.

Assessor guide: confirm that –

The procedures for erecting scaffolding/equipment can be given. The relevant codes, standards and regulatory requirements can be identified. The sequence of operations in erecting the scaffolding/equipment can be identified.

Criteria 11.1A.1.5

Scaffolding/equipment checked for safety and operational requirements.

Assessor guide: observe that –

The scaffolding/equipment is checked for conformance to safety and operational requirements in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for checking the scaffolding/equipment for conformance to safety and operational requirements can be given.

Element 11.1A.2 Dismantle scaffold/equipment**Criteria 11.1A.2.1**

Work undertaken safely and to prescribed procedure.

Assessor guide: observe that –

All work is undertaken safely and in accordance with standard operating procedures.

Assessor guide: confirm that –

The safety procedures to be followed when dismantling scaffolding/equipment can be identified.

Criteria 11.1A.2.2

Scaffolding/equipment dismantled in accordance with site procedures and critical structural and safety requirements.

Assessor guide: observe that –

The scaffolding/equipment is dismantled safely in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for dismantling scaffolding/equipment can be given. The critical structural requirements of scaffolding/equipment can be identified.

Criteria 11.1A.2.3

Site cleaned and cleared of all tools, excess material and debris and left in a safe state.

Assessor guide: observe that –

The site is cleaned and cleared of all tools, excess material and debris and left in a safe state in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for cleaning and clearing the site can be given. The reasons for cleaning and clearing the site can be explained.

Range statement

Work is undertaken to state or territory legislative requirements. Equipment range includes: standing prefabricated tower scaffolds and bracket scaffolds. Work undertaken with supervision or in a team environment.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the erection/dismantling of scaffolding and equipment or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 11.2A B Erect/dismantle complex scaffolding and equipment

Band – Specialisation band A

Field – Materials handling

Unit Weight 4

Pre-requisite units - Path 1

11.1A Erect/dismantle scaffolding and equipment

18.1A Use hand tools

Element 11.2A.1 Erect scaffold/equipment

Criteria 11.2A.1.1

All work undertaken safely and to prescribed procedures.

Assessor guide: observe that –

All relevant job instructions, specifications and procedures are obtained in accordance with work place procedures. All work is undertaken safely and in accordance with standard operating procedures.

Assessor guide: confirm that –

The work to be undertaken can be identified. The safety procedures to be followed can be identified.

Criteria 11.2A.1.2

Erection site prepared to meet job requirements.

Assessor guide: observe that –

The erection site is prepared in accordance with standard operating procedures.

Assessor guide: confirm that –

The erection site can be identified. The procedures for preparing a site for the erection of scaffolding and equipment can be given.

Criteria 11.2A.1.3

Necessary signage and barriers placed in appropriate position.

Assessor guide: observe that –

All necessary signage and barriers are appropriately placed in accordance with standard operating procedures.

Assessor guide: confirm that –

The signs and barriers to be put in place and their location can be identified. The reasons for placing signs and barriers in appropriate positions can be given.

Criteria 11.2A.1.4

Scaffolding/equipment is erected to plan and in accordance with acceptable safe work practices, Australian Standards and equipment manufacturer's requirements.

Assessor guide: observe that –

The scaffolding/equipment is erected in the planned sequence and in accordance with relevant codes, standards, regulations and manufacturer's requirements.

Assessor guide: confirm that –

The procedures for erecting scaffolding/equipment can be given. The relevant codes, standards and regulatory requirements can be identified. The sequence of operations in erecting the scaffolding/equipment can be identified.

Criteria 11.2A.1.5

Scaffolding/equipment checked for safety and operational requirements.

Assessor guide: observe that –

The scaffolding/equipment is checked for conformance to safety and operational requirements in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for checking the scaffolding/equipment for conformance to safety and operational requirements can be given.

Element 11.2A.2 Alter and/or repair scaffolding/equipment**Criteria 11.2A.2.1**

Alterations/repairs coordinated in accordance with safety work practices, Australian Standards and equipment manufacturer's requirements.

Assessor guide: observe that –

The alterations/repairs being undertaken are coordinated in accordance with relevant codes, standards, regulations, safety and operating procedures.

Assessor guide: confirm that –

The alterations/repairs to be carried out on the scaffolding/equipment can be identified. The safety procedures to be followed when altering/repairing scaffolding/equipment can be given. The relevant codes, standards and regulations can be identified.

Criteria 11.2A.2.2

Alterations/repairs inspected for safety and operational requirements.

Assessor guide: observe that –

The alterations/repairs undertaken are inspected for conformance to safety and operational requirements.

Assessor guide: confirm that –

The procedures for inspecting the alterations/repairs can be given. The safety and operational requirements of the scaffolding/ equipment can be identified.

Criteria 11.2A.2.3

Scope of alteration/repair confirmed and understood.

Assessor guide: observe that –

Assessor guide: confirm that –

The scope of the alteration/repair to be undertaken can be identified. The reasons for undertaking the alteration/repair can be given.

Criteria 11.2A.2.4

Existing scaffold/equipment is inspected for suitability of alterations/repair requirements.

Assessor guide: observe that –

The existing scaffolding/equipment is inspected to ensure that the proposed alteration/repair will not adversely affect the safety and operational performance of the scaffolding/equipment.

Assessor guide: confirm that –

The requirement of the alteration/ repair with respect to the existing scaffolding/equipment can be identified. The likely effect of the alteration/ repair on the safety and operational performance of the scaffolding/ equipment can be given.

Criteria 11.2A.2.5

Materials, equipment and tools required for alteration determined.

Assessor guide: observe that –

Assessor guide: confirm that –

The tools, equipment and techniques required to alter/repair the scaffolding/equipment can be identified. The reasons for selecting the chosen tools, equipment and techniques can be given.

Criteria 11.2A.2.6

Work completion recorded/reported to appropriate authority.

Assessor guide: observe that –

Work completion is reported/recorded in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for recording/reporting work completion can be given. The authority to whom work completion is to be reported/ recorded can be given.

Element 11.2A.3 Dismantle scaffold/equipment**Criteria 11.2A.3.1**

Work undertaken safely and to prescribed procedure.

Assessor guide: observe that –

All work is undertaken safely and in accordance with standard operating procedures.

Assessor guide: confirm that –

The safety procedures to be followed when dismantling scaffolding/equipment can be identified.

Criteria 11.2A.3.2

Scaffolding/equipment dismantled in accordance with site procedures and critical structural and safety requirements.

Assessor guide: observe that –

The scaffolding/equipment is dismantled safely in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for dismantling scaffolding/equipment can be given. The critical structural requirements of scaffolding/equipment can be identified.

Criteria 11.2A.3.3

Site cleaned and cleared of all tools, excess material and debris and left in a safe state.

Assessor guide: observe that –

The site is cleaned and cleared of all tools, excess material and debris and left in a safe state in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for cleaning and clearing the site can be given. The reasons for cleaning and clearing the site can be explained.

Range statement

Work to be undertaken to state/territory legislative requirements. Equipment range includes: prefabricated scaffolds, tube and fittings scaffolds, cantilevered hoists, bracket scaffolds, and catch platforms, fall protection devices, cantilevered and spurred scaffolds, platforms and course-ways. Work undertaken with assistants as required or in a team environment with supervision.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the erection/dismantling of scaffolding and equipment or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 11.3A A Coordinate erection/dismantling of complex scaffolding/equipment

Band – Specialisation band A

Field – Materials handling

Unit Weight 4

Pre-requisite units - Path 1

11.1A Erect/dismantle scaffolding and equipment

11.2A Erect/dismantle complex scaffolding and equipment

18.1A Use hand tools

Element 11.3A.1 Coordinate erection of scaffold/equipment

Criteria 11.3A.1.1

All work undertaken safely and to prescribed procedures.

Assessor guide: observe that –

All relevant job instructions, specifications and procedures are obtained in accordance with work place procedures. All work is undertaken safely and in accordance with standard operating procedures.

Assessor guide: confirm that –

The work to be undertaken can be identified. The safety procedures to be followed can be identified.

Criteria 11.3A.1.2

Erection site prepared to meet job and safety requirements.

Assessor guide: observe that –

The erection site is prepared in accordance with standard operating procedures.

Assessor guide: confirm that –

The erection site can be identified. The procedures for preparing a site for the erection of scaffolding and equipment can be given.

Criteria 11.3A.1.3

Necessary signage and barriers placed in appropriate position.

Assessor guide: observe that –

All necessary signage and barriers are appropriately placed in accordance with standard operating procedures.

Assessor guide: confirm that –

The signs and barriers to be put in place and their location can be identified. The reasons for placing signs and barriers in appropriate positions can be given.

Criteria 11.3A.1.4

Scaffolding/equipment erection coordinated in accordance with acceptable safe work practices, Australian Standards and equipment manufacturer's requirements.

Assessor guide: observe that –

The scaffolding/equipment is erected in the planned sequence and in accordance with relevant codes, standards, regulations and manufacturer's requirements.

Assessor guide: confirm that –

The procedures for erecting scaffolding/equipment can be given. The relevant codes, standards and regulatory requirements can be identified. The sequence of operations in erecting the scaffolding/equipment can be identified.

Criteria 11.3A.1.5

Completed scaffolding/equipment inspected for safety and compliance with design, operational and statutory requirements.

Assessor guide: observe that –

The scaffolding/equipment is checked for conformance to design, safety and operational requirements in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for checking the scaffolding/equipment for conformance to design, safety and operational requirements can be given.

Element 11.3A.2 Alterations, repairs of scaffolding/equipment coordinated**Criteria 11.3A.2.1**

Scope of alteration/repair confirmed and understood.

Assessor guide: observe that –

Assessor guide: confirm that –

The scope of the alteration/repair to be undertaken can be identified. The reasons for undertaking the alteration/repair can be given.

Criteria 11.3A.2.2

Existing scaffolding/equipment is inspected and alterations/repairs determined.

Assessor guide: observe that –

The existing scaffolding/equipment is inspected to ensure that the proposed alteration/repair will not adversely affect the safety and operational performance of the scaffolding/equipment.

Assessor guide: confirm that –

The requirement of the alteration/repair with respect to the existing scaffolding/equipment can be identified. The likely effect of the alteration/repair on the safety and operational performance of the scaffolding/equipment can be given.

Criteria 11.3A.2.3

Materials, equipment and tools required for alterations determined.

Assessor guide: observe that –

Assessor guide: confirm that –

The tools, equipment and techniques required to alter/repair the scaffolding/equipment can be identified. The reasons for selecting the chosen tools, equipment and techniques can be given.

Criteria 11.3A.2.4

Existing or new load requirements determined using load tables.

Assessor guide: observe that –

The new or existing load requirements for the scaffolding/equipment are correctly determined in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for determining/ calculating load requirements can be given. The new/existing load requirement can be identified using load tables.

Criteria 11.3A.2.5

Alteration/repairs coordinated in accordance with safety work practices, Australian Standards and equipment manufacturer's requirements.

Assessor guide: observe that –

The alterations/repairs being undertaken are coordinated in accordance with relevant codes, standards, regulations, safety and operating procedures.

Assessor guide: confirm that –

The alteration/repair to be carried out on the scaffolding/equipment can be identified. The safety procedures to be followed when altering/repairing scaffolding/equipment can be given. The relevant codes, standards and regulations can be identified.

Criteria 11.3A.2.6

Alterations/repairs inspected for safety and operational requirements.

Assessor guide: observe that –

The alteration/repair undertaken is inspected for conformance to safety and operational requirements.

Assessor guide: confirm that –

The procedures for inspecting the alteration/repair can be given. The safety and operational requirements of the scaffolding/equipment can be identified.

Criteria 11.3A.2.7

Work completion reported to appropriate personnel and recorded.

Assessor guide: observe that –

Work completion is reported/recorded in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for recording/reporting work completion can be given. The authority to whom work completion is to be reported/recorded can be given.

Element 11.3A.3 Inspect completed scaffolding/equipment**Criteria 11.3A.3.1**

The critical structural and safety areas of the scaffolding/equipment are inspected for damage, corrosion and wear.

Assessor guide: observe that –

The critical structural and safety areas of the scaffolding/equipment are inspected for faults/defects in accordance with standard operating procedures.

Assessor guide: confirm that –

The critical structural and safety areas of the scaffolding/equipment can be identified. The procedures for inspecting the scaffolding/equipment can be given. Common faults/defects in scaffolding/equipment can be described.

Criteria 11.3A.3.2

Scaffolding/equipment and structure is checked against the type of scaffolding/equipment and structure specified in plan.

Assessor guide: observe that –

The scaffolding/equipment is inspected for conformance to specification in accordance with standard operating procedures.

Assessor guide: confirm that –

The scaffolding/equipment and structure specified in the plan can be identified. Any variation of the erected scaffolding/equipment from specification can be identified.

Criteria 11.3A.3.3

Inspection log is completed.

Assessor guide: observe that –

The inspection log is completed in accordance with standard operating procedures.

Assessor guide: confirm that –

The details of the inspection to be recorded in the inspection log can be identified. The procedures for recording inspection details can be given.

Criteria 11.3A.3.4

Potential safety and design/structural hazards are reported for rectification.

Assessor guide: observe that –

Where appropriate, potential safety and design/structural hazards are reported for rectification in accordance with standard operating procedures.

Assessor guide: confirm that –

Common hazards associated with scaffolding/equipment can be identified. The means of rectifying those hazards can be identified. The hazard reporting procedures can be given.

Element 11.3A.4 Dismantling of scaffold/equipment coordinated**Criteria 11.3A.4.1**

Work is coordinated safely and to standard operating procedure.

Assessor guide: observe that –

All work is undertaken safely and in accordance with standard operating procedures.

Assessor guide: confirm that –

The safety procedures to be followed when dismantling scaffolding/equipment can be identified.

Criteria 11.3A.4.2

Scaffolding/equipment dismantling is coordinated and removed from site in accordance with standard operating procedures and critical structural and safety requirements.

Assessor guide: observe that –

The scaffolding/equipment is dismantled safely in accordance with standard operating procedures. The dismantled scaffolding/equipment is removed from the site in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for dismantling scaffolding/equipment can be given. The critical structural requirements of scaffolding/equipment can be identified. The procedures for removing scaffolding/equipment from the site can be given.

Criteria 11.3A.4.3

Site clearance is co-ordinated. Surplus material, equipment, tools and debris are removed and site left in safe and operational state.

Assessor guide: observe that –

The site is cleaned and cleared of all tools, excess material and debris and left in a safe state in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for cleaning and clearing the site can be given. The reasons for cleaning and clearing the site can be explained.

Criteria 11.3A.4.4

Work completion reported to appropriate authority.

Assessor guide: observe that –

Work completion is reported to the appropriate authority in accordance with standard operating procedures.

Assessor guide: confirm that –

Range statement

Work to be undertaken to state/territory legislative requirements. Equipment range includes: suspended scaffolds, cantilevered cranes, loading platforms, hung scaffolds etc. Unit applies to individuals coordinating a scaffolding team or employed in a supervisory capacity.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the coordination of the erection/dismantling of scaffolding/equipment or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 11.4A A Undertake dogging/crane chasing

Band – Specialisation band A

Field – Materials handling

Unit Weight 4

Pre-requisite units - Path 1

18.1A Use hand tools

Element 11.4A.1 Attach lifting gear to loads

Criteria 11.4A.1.1

All work undertaken safely and to prescribed procedures.

Assessor guide: observe that –

All work is undertaken safely in accordance with standard operating procedures.

Assessor guide: confirm that –

The safety procedures to be followed when attaching lifting gear to loads can be given. The work to be undertaken can be identified.

Criteria 11.4A.1.2

Load is inspected and best lifting method determined.

Assessor guide: observe that –

The load to be lifted is inspected.

Assessor guide: confirm that –

A variety of lifting methods and their application can be identified. The most appropriate lifting method for a particular load can be identified. The reasons for selecting the chosen lifting method can be given.

Criteria 11.4A.1.3

Appropriate load shifting equipment is selected.

Assessor guide: observe that –

Assessor guide: confirm that –

A range of load shifting equipment and their application can be identified. The most appropriate load shifting device for a particular load can be identified. The reasons for selecting the chosen load shifting equipment can be given.

Criteria 11.4A.1.4

Lifting gear is inspected and damaged or worn items are labelled and rejected.

Assessor guide: observe that –

The lifting gear is examined for faults or wear in accordance with standard operating procedures. Where appropriate, faulty or worn items are labelled and rejected in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for inspecting lifting gear can be given. Common faults in lifting gear can be identified. The procedures for rejecting faulty lifting gear items can be given.

Criteria 11.4A.1.5

Where appropriate, safe working loads are calculated to Australian Standards.

Assessor guide: observe that –

Where appropriate, the safe working load of the lifting gear is calculated in accordance with Australian Standards and standard operating procedures.

Assessor guide: confirm that –

The procedures for determining/ calculating safe working loads can be given.

Criteria 11.4A.1.6

Lifting gear is attached to load in most appropriate and safe manner and to specifications where required.

Assessor guide: observe that –

The load is safely attached to the lifting gear in the most appropriate way in accordance with specifications and/or standard operating procedures.

Assessor guide: confirm that –

A variety of methods of attaching lifting gear to loads can be identified. The most appropriate means of attaching lifting gear to particular loads can be identified. The reasons for selecting the chosen means of attaching the lifting gear to the load can be given. The lifting specifications for the load to be lifted can be identified.

Element 11.4A.2 Move loads**Criteria 11.4A.2.1**

Load moving is performed to acceptable safe working practices, Australian Standards, codes of practice and specifications.

Assessor guide: observe that –

The load is moved in accordance with the relevant standards, codes, regulations and safety procedures.

Assessor guide: confirm that –

The relevant standards, codes and regulations pertaining to the movement of loads can be identified. The safety procedures to be followed when moving loads can be given.

Criteria 11.4A.2.2

Lifting gear is connected to load mover using safe and appropriate techniques.

Assessor guide: observe that –

The load shifting gear is safely attached to the load mover in the most appropriate way in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for attaching lifting gear to load movers can be given. The methods of attaching lifting gear to load movers can be identified. The most appropriate method of attaching lifting gear to the load mover can be identified. The reasons for selecting the chosen method of attachment can be given.

Criteria 11.4A.2.3

Appropriate communication and signal methods are used to coordinate the load movement in a safe manner.

Assessor guide: observe that –

The load movement is coordinated using appropriate communication and signal methods.

Assessor guide: confirm that –

The procedures for coordinating the movement of loads can be given. The applications of hand, verbal and whistle signals can be identified. The meaning of each hand, verbal and whistle signal to be used in coordinating the movement of loads can be correctly given.

Criteria 11.4A.2.4

Load is grounded or put down in accordance with prescribed procedure, in a safe and stable manner.

Assessor guide: observe that –

The load is lowered and grounded safely in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for grounding lifted loads can be given. The reasons for ensuring the load is in a stable position when grounded can be given.

Criteria 11.4A.2.5

All lifting gear is detached from load mover and load.

Assessor guide: observe that –

All lifting gear is detached from the load mover and the load in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for removing lifting gear from the load mover and the load can be given.

Range statement

Work is undertaken to state/territory legislative requirements. Equipment range may include: slings, ropes, shackles, eye bolts, spreader beams, chain blocks etc. Signals include: stop, raise, lower, slew, luff, extend boom and retract boom, using hands, verbal and whistles. Signals are given both within sight and out of sight of equipment operators. This unit is not intended to apply to machine loading and simple straight lifts where knowledge of codes and signals is not required.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with crane chasing and dogging or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 11.5A A Pick and process order

Band – Specialisation band A

Field – Materials handling

Unit Weight 4

Element 11.5A.1 Receive order

Criteria 11.5A.1.1

Order to be picked is received and checked for errors.

Assessor guide: observe that –

The order to be picked is received and checked for errors in accordance with standard operating procedures. Where appropriate, errors detected in orders received are dealt with in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for receiving orders can be given. Common errors in given orders can be identified. The procedures to be followed when errors are detected in the orders received can be given.

Criteria 11.5A.1.2

Product to be picked is identified.

Assessor guide: observe that –

Assessor guide: confirm that –

The product(s) to be picked and the quantities to be picked can be identified from the order.

Element 11.5A.2 Pick order

Criteria 11.5A.2.1

Appropriate materials handling equipment selected and used, if required.

Assessor guide: observe that –

Where appropriate, the most suitable materials handling equipment is used in accordance with standard operating procedures.

Assessor guide: confirm that –

The materials handling equipment available to assist in order picking can be identified. The application of each type of materials handling equipment available can be identified. The procedures for using materials handling equipment can be given. The reasons for selecting the chosen materials handling equipment to pick given orders can be explained.

Criteria 11.5A.2.2

Products to be picked are located using standard operating procedures.

Assessor guide: observe that –

The ordered products are located and picked in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for locating products can be given. The location of given products can be correctly identified.

Criteria 11.5A.2.3

Order is picked accurately either by manual handling or the use of materials handling equipment.

Assessor guide: observe that –

The order is picked accurately using the appropriate handling technique.

Assessor guide: confirm that –

Criteria 11.5A.2.4

Product is handled according to storage and handling requirements identified from standard operating procedure regulations.

Assessor guide: observe that –

All products are handled and stored in accordance with the product requirements and standard operating procedures.

Assessor guide: confirm that –

The safe handling procedures for products within the store or warehouse can be identified. The source of storage and handling requirements for individual products can be identified. The consequences of using inappropriate handling and storage techniques can be given.

Element 11.5A.3 Finalise order picking**Criteria 11.5A.3.1**

Picked order is checked against documentation.

Assessor guide: observe that –

The picked order is checked against documentation in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for checking orders can be given.

Criteria 11.5A.3.2

Picked order is placed in correct area for consolidation.

Assessor guide: observe that –

The picked order is placed in the correct area for consolidation in accordance with standard operating procedures.

Assessor guide: confirm that –

The area for order consolidation can be identified. The procedures for consolidating orders can be given.

Criteria 11.5A.3.3

Enterprise documentation is completed.

Assessor guide: observe that –

The relevant documentation is completed in accordance with standard operating procedures.

Assessor guide: confirm that –

The documentation to be completed once the order has been picked can be identified. The procedures for recording picked orders can be given.

Range statement

Work undertaken autonomously in a store or warehouse environment or as part of a team. If materials handling equipment skills are needed, Unit 11.10A (Operate mobile load shifting equipment) should be accessed. This unit applies where the employee has to exercise knowledge of the enterprise product range and the procedures, practices and standards for the storage and handling of a product. Simple handling of goods not requiring the ability to identify different products or to interact with inventory records and stock location systems is covered by Units 11.10A (Operate mobile load shifting equipment) or Unit 11.11A (Manual handling). All work undertaken to legislative and regulatory requirements.

Evidence guide

Assessment context

This unit should be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the picking and processing of orders or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 11.6A A Production packaging

Band – Specialisation band A

Field – Materials handling

Unit Weight 2

Element 11.6A.1 Undertake packaging

Criteria 11.6A.1.1

Packaging requirements identified from instructions or determined by safety, storage conditions, site and legislative requirements.

Assessor guide: observe that –

All relevant job instructions, specifications, procedures, etc. are obtained in accordance with work place procedures.

Assessor guide: confirm that –

The packaging requirements can be identified. Any relevant legislative requirements can be identified.

Criteria 11.6A.1.2

Packaging undertaken to standard operating procedures.

Assessor guide: observe that –

The finished products are packaged in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for packaging the finished product can be given. The packaging materials to be used can be identified.

Element 11.6A.2 Label packaged items

Criteria 11.6A.2.1

Ensure identification labels, tags and stickers are correct and appropriately placed and attached.

Assessor guide: observe that –

The appropriate identification labels, tags and stickers are correctly placed and attached in accordance with standard operating procedures.

Assessor guide: confirm that –

All relevant identification labels, tags and stickers can be identified. The placement requirements for identification labels, tags and stickers can be identified. The procedures for attaching identification labels, tags and stickers can be given.

Criteria 11.6A.2.2

Packaged items stored in safe, orderly and retrievable manner and the location in the warehouse/store recorded.

Assessor guide: observe that –

The packaged products are correctly stored in accordance with standard operating procedures. The location of the packaged products is recorded in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for storing packaged products can be given. The location in which the packaged products are to be placed can be identified. The procedures for recording the placement of packaged products in the store/warehouse can be given. The procedures for handling packaged products can be given. The consequences of inappropriate handling and storing of packaged products can be explained.

Range statement

This unit covers the packaging of finished goods for storage or transport. Finished goods include assemblies, sub-assemblies, individual or multiple components. Work undertaken autonomously and/or in a team environment. Procedures undertaken include standards, codes, legislative, company and customer requirements. Packaging material generally determined from instructions, written or verbal. Packaging methods include manual processes, semi-automated or fully automated packaging equipment. Competencies in this unit are typically performed in a production/process environment. This unit is not intended to apply in situations where simple interim packing, storage and/or stacking are undertaken in context of a production function.

Evidence guide

Assessment context

This unit should be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with production packaging or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 11.7A A Administer inventory procedures

Band – Specialisation band A

Field – Materials handling

Unit Weight 4

Pre-requisite units - Path 1

2.7C10 Perform computations - basic

Element 11.7A.1 Use inventory procedures

Criteria 11.7A.1.1

Inventory procedures understood and carried out to standard operational procedures.

Assessor guide: observe that –

Inventory procedures carried out in accordance with work site requirements.

Assessor guide: confirm that –

The tasks to be completed in following inventory procedure can be identified.

Criteria 11.7A.1.2

Requisition, purchase, shipping and invoice documentation used as required to standard operational procedures.

Assessor guide: observe that –

Requisition, purchase, shipping and invoice documents completed, where appropriate, in accordance with work site procedures.

Assessor guide: confirm that –

The documents to be completed for requisition, purchase, shipping and invoice purposes can be identified. Applications for each of the requisition, purchase, shipping and invoice documents can be given.

Criteria 11.7A.1.3

Inward/outward recording/filing system understood, accessed and maintained to standard operational procedures.

Assessor guide: observe that –

All goods inward and outward from the store are recorded and filed in accordance with work site procedures. Information about inward/outward goods movements can be accessed from filing system in accordance with work site procedures.

Assessor guide: confirm that –

The information to be recorded for inward/outward goods can be identified. The filing procedures for inward/outward goods can be identified.

Criteria 11.7A.1.4

Customer orders maintained to standard operational procedures.

Assessor guide: observe that –

Customer's order filled in accordance with work site procedures.

Assessor guide: confirm that –

Customer requirements can be identified from orders.

Criteria 11.7A.1.5

Returned orders booked back using standard operational procedures.

Assessor guide: observe that –

Returned orders are booked back in accordance with work site procedures.

Assessor guide: confirm that –

The procedures for booking back return orders can be identified.

Element 11.7A.2 Requisition goods**Criteria 11.7A.2.1**

Requisition procedures understood and carried out to standard operational procedures.

Assessor guide: observe that –

Goods are requisitioned in accordance with work site procedures.

Assessor guide: confirm that –

The procedures for requisitioning goods can be identified.

Criteria 11.7A.2.2

Goods requisitioned on time.

Assessor guide: observe that –

Requisitioned goods are received on time.

Assessor guide: confirm that –

The required delivery time for the goods can be identified. The lead time from requisitioning to delivery of the goods can be identified.

Criteria 11.7A.2.3

All recording completed and filed correctly in accordance with site procedures.

Assessor guide: observe that –

All records completed and filed in accordance with work site procedures.

Assessor guide: confirm that –

The recording requirements for requisitioned goods can be identified. The procedure for filing requisition documents can be identified.

Range statement

Work undertaken autonomously or in a team environment. Standard operational procedures undertaken include Just-in-Time, Kan Ban etc. All work and work practices undertaken to regulatory and legislative requirements. This unit refers to administering inventory procedures using manual or electric systems to support and/or maintain stores or inventory systems, for example, Just-in-Time or Kan Ban system. Where routine activity within standard operating procedure is undertaken, refer to Unit 2.2C11 (Organise and analyse information) or Unit 2.9C10 (Perform computer operations).

Evidence guide

Assessment context

This unit should be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with inventory procedures, or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documents required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment, the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities.

Unit MEM 11.8A A Package materials (stores and warehouse)

Band – Specialisation band A

Field – Materials handling

Unit Weight 2

Element 11.8A.1 Determine packaging requirements

Criteria 11.8A.1.1

Determine safety or special requirements.

Assessor guide: observe that –

All relevant work instructions, material and safety data sheets are obtained in accordance with work place procedures.

Assessor guide: confirm that –

The material to be packaged can be identified. The source of information on the characteristics of the material to be packaged can be identified. Any safety or special requirements to be taken into account when packaging the material can be identified.

Criteria 11.8A.1.2

Determine storage requirements to meet safety, storage conditions, site and legislative requirements.

Assessor guide: observe that –

Assessor guide: confirm that –

The storage requirements of the material can be identified. Any relevant legislative requirements can be identified.

Criteria 11.8A.1.3

Determine transport and store requirements.

Assessor guide: observe that –

Assessor guide: confirm that –

The requirements for transporting the packaged material can be identified. The requirements of the store/warehouse with respect to the material to be packaged can be identified.

Element 11.8A.2 Undertake packaging**Criteria 11.8A.2.1**

Undertake most appropriate packaging method.

Assessor guide: observe that –

The material is packaged using the most appropriate method in accordance with standard operating procedures.

Assessor guide: confirm that –

The methods of packaging available and their application can be identified. The packaging materials and techniques required for each packaging method can be identified. The procedures for packaging materials can be given.

Criteria 11.8A.2.2

Ensure seal, compression and correct packaging material used.

Assessor guide: observe that –

The correct packaging materials have been used, the package has been sealed and movement of materials within the package minimised in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for sealing packaged materials can be given. The use of packing to prevent movement of materials within a package can be explained. The reasons for selecting the chosen packaging materials can be given.

Element 11.8A.3 Label packaged items**Criteria 11.8A.3.1**

Ensure labels, identification stickers are attached and describe accurately content of package and are placed in appropriate location.

Assessor guide: observe that –

The packaged products are correctly labelled in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for labelling packaged products can be given. The information to be included in the label can be identified. The method of attaching the label to the package can be identified. The appropriate location for the label can be identified. The consequences of incomplete or inaccurate labelling of packaged products can be given.

Range statement

Work undertaken autonomously or in a team environment using predetermined standards of quality, safety and workplace procedures. Major areas of consideration in selecting appropriate packaging include stacking, storage, weight, size, material type and expected life and transport requirements. Packaging includes sequenced packaging and point of pick up packaging, packaging materials and methods. All work and work practices undertaken to regulatory and legislative requirements. Competencies covered by this unit are typically performed in a store or warehouse and often relate to receive or despatch functions.

Evidence guide

Assessment context

This unit should be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the packaging of materials in stores and warehouses or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 11.9A A Handle/move bulk fluids/gases

Band – Specialisation band A

Field – Materials handling

Unit Weight 4

Element 11.9A.1 Determine handling methods

Criteria 11.9A.1.1

Type of material determined from labels, colour codes, signage.

Assessor guide: observe that –

Assessor guide: confirm that –

The labels, colour codes and signs used to identify bulk fluids and gases can be identified. Given examples of labels, colour codes and signs, the type of material can be correctly identified.

Criteria 11.9A.1.2

Material properties understood.

Assessor guide: observe that –

All relevant instructions, charts, manufacturer's specifications and information sheets are obtained in accordance with workplace procedures.

Assessor guide: confirm that –

The properties of a range of materials can be identified.

Criteria 11.9A.1.3

All relevant uncertainties and unknowns clarified with appropriately qualified and authorised authority.

Assessor guide: observe that –

Assessor guide: confirm that –

The procedures for dealing with unknown materials and/or materials whose properties are unknown can be identified. The source(s) of appropriate information about the unknown materials can be identified. Where appropriate, the relevant authorisations have been received before handling/moving unknown materials. All relevant uncertainties and unknowns about the material(s) have been clarified by the appropriate authority.

Criteria 11.9A.1.4

All relevant safety and emergency procedures understood and implemented as required.

Assessor guide: observe that –

All safety procedures are followed at all times in accordance with standard operating procedures. Where appropriate, emergency and safety procedures are followed correctly during drills and exercises.

Assessor guide: confirm that –

All relevant safety and emergency procedures can be identified. All relevant personal protective clothing and equipment can be identified. The function of personal protective equipment and clothing can be explained.

Criteria 11.9A.1.5

All relevant codes of practice and regulations understood and observed.

Assessor guide: observe that –

All work is carried out in conformance to the relevant codes of practice and regulatory requirements.

Assessor guide: confirm that –

The relevant codes of practice and regulatory requirements can be identified.

Criteria 11.9A.1.6

Correct and appropriate handling methods undertaken.

Assessor guide: observe that –

All materials are handled using correct and appropriate methods in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for handling a range of materials can be identified. The reasons for using these procedures when handling the range of materials can be explained.

Element 11.9A.2 Store bulk fluids/gases**Criteria 11.9A.2.1**

Correct storage conditions determined from instructions/manufacturer's specifications/directions.

Assessor guide: observe that –

The storage instructions, manufacturer's specifications and/or directions are obtained in accordance with workplace procedures.

Assessor guide: confirm that –

The storage conditions for a range of materials can be identified.

Criteria 11.9A.2.2

Containers checked for safe and clean use.

Assessor guide: observe that –

The storage container is checked for cleanliness and safety before use, in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for checking storage containers before use can be identified. The cleaning requirements of storage containers for a range of materials can be identified. The safety requirements of storage containers for a range of materials can be identified.

Criteria 11.9A.2.3

Containers filled/emptied in accordance with standard operating procedures, regulations/legislative requirements.

Assessor guide: observe that –

Storage containers are filled/ emptied in accordance with standard operating procedures and relevant regulatory/legislative requirements.

Assessor guide: confirm that –

The procedures for filling/emptying storage containers for a range of materials can be identified. The relevant regulatory/legislative requirements applying to the filling and emptying of storage containers for a range of materials can be identified.

Criteria 11.9A.2.4

Containers handled and moved in accordance with site procedures, regulations/legislative requirements.

Assessor guide: observe that –

Where appropriate, the storage containers are handled and moved in accordance with standard operating procedures and relevant regulatory/legislative requirements.

Assessor guide: confirm that –

Criteria 11.9A.2.5

Containers correctly labelled and stored to standard operational procedures, regulations/legislative requirements.

Assessor guide: observe that –

All containers are correctly labelled and stored in accordance with standard operating procedures and relevant regulatory/legislative requirements.

Assessor guide: confirm that –

The labelling requirements of bulk fluids and gases can be identified. The procedures for labelling and storing a range of materials can be identified. The relevant regulatory/legislative requirements applying to the storage of a range of materials can be identified.

Range statement

Work undertaken autonomously or in a team environment using predetermined standards of quality, safety and workplace practices. Emergency procedures predetermined by appropriately qualified and authorised personnel. Material properties determined from instructions, charts, manufacturers' specifications and information sheets. All work and work practices undertaken to regulatory and legislative requirements. Refers to all vessels used to store bulk fluids/gases. Bulk refers to commercial quantities of fluids and gases greater than the quantities required by individuals to do their own jobs.

Evidence guide

Assessment context

This unit should be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the handling and movement of bulk fluids and gases or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 11.10A A Operate mobile load shifting equipment

Band – Specialisation band A

Field – Materials handling

Unit Weight 4

Element 11.10A.1 Conduct routine operation and safety checks of load shifting equipment

Criteria 11.10A.1.1

Routine pre-use checks undertaken in accordance with manufacturer's specifications and regulatory safety requirements.

Assessor guide: observe that –

Routine pre-use checks carried out in accordance with manufacturer's, regulatory and work site requirements.

Assessor guide: confirm that –

The pre-use checks to be undertaken for the particular load shifting device can be identified.

Criteria 11.10A.1.2

Non-compliance with specification reported for repair/replacement using standard operating procedure.

Assessor guide: observe that –

Variations of the load shifting device from manufacturer's specifications reported to appropriate person for repair/replacement.

Assessor guide: confirm that –

The manufacturer's specifications for the load shifting device can be identified. The person to whom variations from specification are to be reported can be identified.

Element 11.10A.2 Shifts loads

Criteria 11.10A.2.1

Most appropriate load shifting device selected.

Assessor guide: observe that –

Assessor guide: confirm that –

Examples of load shifting devices appropriate to the loading task and lift can be given. The most appropriate load shifting device can be identified.

Criteria 11.10A.2.2

Load shifting device operated within design specifications and safe working load in accordance with standard operating procedures.

Assessor guide: observe that –

The load shifting device is operated within design specifications and safe working loads.

Assessor guide: confirm that –

The safe working load and any design limitations applying to the selected load shifting device can be identified.

Criteria 11.10A.2.3

Load is lifted, ensuring balance, vision of operation and protection of load.

Assessor guide: observe that –

The load lifted is balanced, the operator has good vision of the area of operation and the load is adequately protected in accordance with work site procedures.

Assessor guide: confirm that –

The hazards with respect to the load, the operator and others when loads are being lifted can be identified.

Criteria 11.10A.2.4

Safe and efficient path of movement selected and used.

Assessor guide: observe that –

The load is moved safely and efficiently to its destination in accordance with work site procedures.

Assessor guide: confirm that –

The hazards associated with the movement of loads can be identified. The most direct, safe path for movement of the load can be identified.

Criteria 11.10A.2.5

Path of movement is checked and monitored for obstacles and hazards and safely maintained.

Assessor guide: observe that –

The path of movement is checked and monitored for obstacles and hazards and safely maintained.

Assessor guide: confirm that –

Potential obstacles and hazards that would affect the safety of the path of movement of the load can be identified.

Element 11.10A.3 Place loads**Criteria 11.10A.3.1**

Loads are placed ensuring safety, stability, protection of material and avoidance of hazards on site.

Assessor guide: observe that –

All loads are placed safely and the stability and protection of the load material is ensured at all times in accordance with work site procedures.

Assessor guide: confirm that –

The requirements for load protection can be identified. The hazards to the load, the operator and others during the placing of loads can be identified.

Range statement

Work undertaken autonomously or in a team environment. Load shifting equipment includes front end loaders/back hoe, ride on fork lifts/pallet trucks, scissor lifts/boom lifts. Load shifting equipment is operated within limits of manufacturer's recommended procedures and safe working loads. All work and work practices undertaken to regulatory and legislative requirements. This unit applies to loading tasks and lifts where knowledge of codes and signals is not required. If the use of hand tools is required, see Unit 18.1A (Use hand tools).

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the operation of load shifting equipment, or other units requiring the exercise of the skills and knowledge covered by this unit.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. - The type of data and the frequency with which data is to be accessed/recorded. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment, the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities.

Unit MEM 11.11A A Manual handling

Band – Specialisation band A

Field – Materials handling

Unit Weight 2

Element 11.11A.1 Lift materials manually

Criteria 11.11A.1.1

Material weight determined correctly utilising most appropriate technique.

Assessor guide: observe that –

The weight of the material to be lifted/moved is determined correctly by using the most appropriate procedure/technique.

Assessor guide: confirm that –

The procedures/techniques for determining the weight of materials to be moved and/or lifted can be identified. Any limitations on the weight of materials to be moved and/or lifted can be identified. Where appropriate, the equipment to be used to determine the weight of materials can be identified.

Criteria 11.11A.1.2

Lifting techniques undertaken to Worksafe Australia Standards and standard operating procedures. Types of movement, methods, storage, height and position considered.

Assessor guide: observe that –

All lifting is carried out safely in accordance with Worksafe Australia Standards and standard operating procedures.

Assessor guide: confirm that –

Worksafe Australia Standards for lifting can be identified. The effect of types of movement methods, storage height and position on the lifting techniques to be used can be explained. Where appropriate, the procedures for manual handling of materials can be identified.

Element 11.11A.2 Move/shift materials manually

Criteria 11.11A.2.1

Appropriate equipment selected where required.

Assessor guide: observe that –

Where appropriate, the correct equipment is selected to manually move materials.

Assessor guide: confirm that –

A range of moving/shifting equipment and its application can be identified. The reasons for selecting the chosen moving/shifting equipment can be given.

Criteria 11.11A.2.2

Material is placed safely and securely on moving equipment.

Assessor guide: observe that –

Where appropriate, the material to be moved is placed safely and securely onto the moving equipment.

Assessor guide: confirm that –

The loading procedures for a range of moving/shifting equipment can be identified. The safe handling requirements of the materials to be placed on the moving/shifting equipment can be identified. Where appropriate, the procedures for fastening materials onto moving/ shifting equipment can be identified.

Criteria 11.11A.2.3

Material is relocated ensuring safety of personnel and security of material.

Assessor guide: observe that –

The material is relocated safely in accordance with standard operating procedures.

Assessor guide: confirm that –

The path to be traversed with the material/moving equipment can be identified. The hazards associated with the movement of the material/moving equipment amongst other personnel, equipment and materials can be identified. The safety procedures to be followed when moving materials/equipment can be identified.

Criteria 11.11A.2.4

Material is unloaded from moving equipment and placed in a safe and secure manner.

Assessor guide: observe that –

Where appropriate, the material is unloaded from the moving equipment and placed in a safe and secure manner in accordance with standard operating procedures.

Assessor guide: confirm that –

The storage requirements of the material being moved can be identified.

Range statement

Work undertaken autonomously or in a team environment. Material weight is determined utilising scales or interpreting signage. Moving/shifting equipment includes hand trolleys wheelbarrows, motorised/hand pallet trucks (not sit on), hand carts, dedicated production or process lifting equipment eg: baskets, spreader bars, cradles or the like attached to lifting equipment etc. Maximum manual lifting weight limited to Worksafe Australia Standards. All work and work practices undertaken to regulatory and legislative requirements and standard operating procedures where applicable.

Evidence guide

Assessment context

This unit should be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with manual handling or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 11.12A A Purchase materials

Band – Specialisation band A

Field – Materials handling

Unit Weight 6

Element 11.12A.1 Determine purchasing requirements

Criteria 11.12A.1.1

Consult with client, customer, user as appropriate.

Assessor guide: observe that –

Appropriate consultation occurs with the client/customer/user.

Assessor guide: confirm that –

The client, customer and/or user can be identified.

Criteria 11.12A.1.2

Material specifications determined from orders, instructions and/or technical drawings.

Assessor guide: observe that –

All relevant instructions, orders, requisitions, technical drawings and/or bills of material obtained in accordance with workplace procedures.

Assessor guide: confirm that –

The material/component specifications can be identified. The source(s) of additional information/advice with respect to material/component specification can be identified.

Criteria 11.12A.1.3

Quantities, price limitations and delivery requirements determined from orders, instructions.

Assessor guide: observe that –

Assessor guide: confirm that –

The quantities of materials/ components to be purchased can be identified. The price limitations on materials/ components to be purchased can be identified. The delivery requirements can be identified.

Element 11.12A.2 Prepare purchase order/list

Criteria 11.12A.2.1

Purchase order/list developed to standard operational procedure.

Assessor guide: observe that –

Purchase orders/lists are prepared in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for ordering materials/components can be identified. The appropriate purchase order forms can be identified.

Element 11.12A.3 Purchase material**Criteria 11.12A.3.1**

Standard operational procedures followed.

Assessor guide: observe that –

Materials are purchased in accordance with standard operating procedures.

Assessor guide: confirm that –

Where appropriate, preferred/ contracted suppliers of materials/ components can be identified. The procedures for purchasing materials/components can be identified.

Criteria 11.12A.3.2

Supplier/vendor informed of requirements and specifications.

Assessor guide: observe that –

The supplier/vendor is informed of the material/component requirements and specifications in accordance with standard operating procedures.

Assessor guide: confirm that –

The appropriate supplier(s)/ vendor(s) of a range of materials/components can be identified. The procedures to be followed in informing supplier(s)/vendor(s) of the purchase requirements can be given.

Criteria 11.12A.3.3

Purchasing schedules adjusted where required to standard operational procedures.

Assessor guide: observe that –

Where appropriate, purchasing schedules are adjusted in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for adjusting purchasing schedules can be identified. The reasons for adjusting purchasing schedules can be explained. Where appropriate, approval to adjust the purchasing schedule is received from the relevant authority. The personnel affected by a change in purchasing schedules can be identified. Where appropriate, all relevant personnel are informed of the adjustment to the purchasing schedule.

Criteria 11.12A.3.4

Appropriate paperwork/contracts exchanged to standard operational procedure.

Assessor guide: observe that –

Assessor guide: confirm that –

All paper work/contracts associated with the purchasing of materials/components can be identified and their application given. The appropriate paper work/contracts are exchanged in accordance with standard operating procedures.

Criteria 11.12A.3.5

Records/files maintained accurately using standard operating procedures.

Assessor guide: observe that –

All relevant records/files are completed/maintained accurately in accordance with standard operating procedures.

Assessor guide: confirm that –

The records/files to be completed/maintained of purchases made can be identified. The recording/filing procedures can be identified.

Range statement

Purchasing schedules developed to site procedures and for pre-contracted suppliers/vendors. Contracts/paperwork generated manually or electronically utilising on-site system. Purchasing can cover one-off or multiple quantities of raw materials, components, equipment etc. Purchasing specifications are determined from standard engineering drawings and data sheets, instructions written or verbal. All work and work practices undertaken to regulations or legislative requirements.

Evidence guide**Assessment context**

This unit should be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the purchasing of materials or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 11.13A A Undertake warehouse receipt process

Band – Specialisation band A

Field – Materials handling

Unit Weight 4

Pre-requisite units - Path 1

11.11A Manual handling

Element 11.13A.1 Check supplier documentation

Criteria 11.13A.1.1

Supplier documentation checked against order according to standard operating procedure.

Assessor guide: observe that –

The order is obtained in accordance with workplace procedures. The supplier's documentation is checked against the initiating order in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for checking supplier documentation against the order can be given.

Element 11.13A.2 Confirm the quality and quantity of received goods

Criteria 11.13A.2.1

Quality and quantity of goods checked against order and supplier documentation.

Assessor guide: observe that –

The quality and quantity of goods received is checked against the order and supplier documentation in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for checking the quality and quantity of goods received can be given.

Criteria 11.13A.2.2

Incorrect and damaged goods identified and appropriate action taken according to standard operating procedure.

Assessor guide: observe that –

Where appropriate, the required action is taken with respect to incorrect and/or damaged goods identified in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures to be followed when incorrect and/or damaged goods are detected can be given.

Element 11.13A.3 Unloading of goods arranged

Criteria 11.13A.3.1

Goods requiring special unloading procedures are identified..

Assessor guide: observe that –

Assessor guide: confirm that –

The unloading requirements of the goods can be identified from the relevant documentation.

Criteria 11.13A.3.2

Goods unloaded using manual handling or appropriate lifting equipment.

Assessor guide: observe that –

The goods are unloaded safely using the most appropriate unloading method in accordance with standard operating procedures.

Assessor guide: confirm that –

The most appropriate means of unloading the goods can be identified. The reasons for selecting the chosen unloading method can be given. The procedures for unloading goods can be given.

Criteria 11.13A.3.3

Carrier or supplier documentation signed or processed according to standard operating procedure.

Assessor guide: observe that –

The carrier or supplier documentation is signed/processed in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for signing carrier or supplier documentation can be given. The reasons for ensuring the accuracy of the documentation being processed can be explained.

Element 11.13A.4 Prepare, locate and store received goods**Criteria 11.13A.4.1**

Goods are prepared for storage according to standard operating procedure.

Assessor guide: observe that –

Goods are prepared for storage in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for preparing goods for storage can be given.

Criteria 11.13A.4.2

Signs, codes or labels applied according to standard operating procedure.

Assessor guide: observe that –

The appropriate signs, codes or labels are applied to the goods to be stored in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for identifying goods to be stored can be given. The method of identification to be applied to the goods can be given.

Criteria 11.13A.4.3

Inventory records documentation completed.

Assessor guide: observe that –

Inventory records are accurately completed.

Assessor guide: confirm that –

The records to be completed can be identified.

Criteria 11.13A.4.4

Storage location identified.

Assessor guide: observe that –

The storage location is accurately recorded.

Assessor guide: confirm that –

The procedures for locating goods in the store/warehouse can be given.

Criteria 11.13A.4.5

Goods stored in correct location using appropriate materials handling techniques.

Assessor guide: observe that –

The goods are stored in the correct location in the store/warehouse using the most appropriate materials handling technique.

Assessor guide: confirm that –

The correct location of the store/ warehouse in which given goods are to be stored can be identified. The materials handling technique to be used can be identified. The reasons for selecting the chosen materials handling technique can be given.

Range statement

Work undertaken autonomously or in a team environment. This unit applies to the receipt of goods in a store or warehousing environment applying knowledge of the warehouse and systems and procedures. Complementary communication, planning and quality skills are described in the appropriate core units. If load shifting equipment operation skills are required, Unit 11.10A (Operate mobile load shifting equipment) should be accessed. If hazardous goods are received and handled, Unit 13.3A (Work safely with industrial chemicals and materials) should also be accessed. If the received goods are bulk fluids or gases (i.e. large commercial quantities), then Unit 11.9A (Handle/move bulk fluids/gases) may also apply. All work undertaken to legislative and regulatory requirements.

Evidence guide

Assessment context

This unit should be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the undertaking of warehouse receipt processes or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 11.14A A Undertake warehouse dispatch process

Band – Specialisation band A

Field – Materials handling

Unit Weight 4

This unit covers the competencies required to arrange and consolidate orders, prepare the goods and dispatch them. This unit applies to the dispatch of goods in a store or

warehousing environment and the application of the knowledge of warehouse systems and procedures.

Pre-requisite units - Path 1

11.6A Production packaging

11.11A Manual handling

Pre-requisite units - Path 2

11.8A Package materials (stores and warehouse)

11.11A Manual handling

Element 11.14A.1 Arrange and consolidate orders

Criteria 11.14A.1.1

Packed orders are consolidated into customer or carrier batches according to standard operating procedure

Assessor guide: observe that –

The packaged orders are consolidated into customer or carrier batches in accordance with standard operating procedures

Assessor guide: confirm that –

The procedures for consolidating orders can be given
The reasons for consolidating orders into customer/carrier batches can be explained

Criteria 11.14A.1.2

Consolidated goods placed into correct dispatch area

Assessor guide: observe that –

The consolidated goods are placed in the correct dispatch area

Assessor guide: confirm that –

The correct dispatch area for the given customer/carrier can be identified

Element 11.14A.2 Goods prepared for dispatch

Criteria 11.14A.2.1

Goods packed, shrink-wrapped and/or palletised

Assessor guide: observe that –

Goods for dispatch are packed, shrink-wrapped and/or palletised in accordance with standard operating procedures

Assessor guide: confirm that –

The procedures for packing goods for dispatch can be given
The materials and techniques used for packing goods for dispatch can be identified

Criteria 11.14A.2.2

Goods labelled and appropriate documentation attached according to standard operating procedure

Assessor guide: observe that –

The goods for dispatch are correctly labelled and the appropriate documentation attached in accordance with standard operating procedures

Assessor guide: confirm that –

The procedures for labelling goods for dispatch can be given
The method of attaching the label and appropriate documentation can be identified
The documentation to be included with the dispatched goods can be identified

<p>Criteria 11.14A.2.3 Goods placed in dispatch area ready for loading according to pick-up schedule and carrier requirements</p>	<p><i>Assessor guide: observe that –</i> The goods are placed in the dispatch area ready for loading in accordance with pick-up schedule and carrier requirements</p>	<p><i>Assessor guide: confirm that –</i> The goods pick-up schedule and any special carrier requirements can be identified</p>
<p>Element 11.14A.3 Dispatch goods</p>		
<p>Criteria 11.14A.3.1 Carrier and customer documentation checked</p>	<p><i>Assessor guide: observe that –</i> Carrier and customer documentation is checked in accordance with standard operating procedures</p>	<p><i>Assessor guide: confirm that –</i> The procedures for checking customer and carrier documentation can be given</p>
<p>Criteria 11.14A.3.2 Loading and transportation requirements are accurately communicated to driver and received from the driver</p>	<p><i>Assessor guide: observe that –</i> The loading and transportation requirements are accurately communicated to the driver and received from the driver</p>	<p><i>Assessor guide: confirm that –</i> The loading and transportation requirements can be identified</p>
<p>Criteria 11.14A.3.3 Goods loaded onto vehicle using appropriate materials handling techniques</p>	<p><i>Assessor guide: observe that –</i> The goods are loaded onto the vehicle using appropriate materials handling techniques</p>	<p><i>Assessor guide: confirm that –</i> The appropriate materials handling technique is selected to load the goods onto the transport vehicle The reasons for selecting the chosen materials handling technique can be given</p>
<p>Criteria 11.14A.3.4 Inventory records documentation completed</p>	<p><i>Assessor guide: observe that –</i> The inventory records are accurately completed</p>	<p><i>Assessor guide: confirm that –</i> The inventory records to be completed can be identified The consequences of inaccurate or incomplete inventory records can be explained</p>

Range statement

Work undertaken autonomously or in a team environment. This unit applies to the dispatch of goods in a store or warehouse environment applying knowledge of warehouse systems and procedures. Complementary communication, planning and quality skills are described in appropriate core units. If load shifting equipment operation skills are required, Unit 11.10A (Operate mobile load shifting equipment) should be accessed. If hazardous goods are dispatched, Unit 13.3A (Work safely with industrial chemicals and materials) should also be accessed. If the dispatched goods are bulk fluids and gases (i.e. large commercial quantities), then Unit 11.9A (Handle/move bulk fluids/gases) may also apply. All work undertaken to legislative and regulatory requirements.

Evidence**Assessment context**

This unit should be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the undertaking of warehouse dispatch processes or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 11.15A A Manage warehouse inventory system

Band – Specialisation band A

Field – Materials handling

Unit Weight 6

Pre-requisite units - Path 1

2.1C12 Apply quality systems

2.7C10 Perform computations - basic

11.7A Administer inventory procedures

Element 11.15A.1 Monitor warehouse record keeping processes

Criteria 11.15A.1.1

Monitoring procedures developed for requisition, purchase, shipping and invoice documentation.

Assessor guide: observe that –

Warehouse record keeping processes are monitored in accordance with relevant procedures.

Assessor guide: confirm that –

The documentation to be completed for requisition, purchase, shipping and invoice purposes can be identified. The reasons for monitoring the above documentation can be explained. The frequency at which the above documentation should be monitored can be identified. Document monitoring procedures have been developed and implemented.

Criteria 11.15A.1.2

Discrepancy reporting procedures established for warehouse and other personnel in accordance with standard operating procedure.

Assessor guide: observe that –

Discrepancy reporting procedures are being followed by warehouse and other relevant personnel.

Assessor guide: confirm that –

The reasons for reporting discrepancies between warehouse records can be explained. The person(s) responsible for reporting detected discrepancies can be identified. Discrepancy reporting procedures have been developed and implemented.

Criteria 11.15A.1.3

Audit and achieve procedures followed according to standard operating procedure.

Assessor guide: observe that –

The records of audits of warehouse record keeping processes have been appropriately maintained in accordance with established audit procedures. Warehouse and other relevant personnel comply with the requirements of the warehouse record keeping procedures.

Assessor guide: confirm that –

The reasons for auditing record keeping procedures can be explained. The frequency with which audits are to be conducted can be identified. The audit procedures can be identified. Where appropriate, the actions undertaken to ensure warehouse record keeping procedures are followed can be identified and explained. Warehouse and other relevant personnel can identify the relevant warehouse record keeping procedures.

Element 11.15A.2 Supervise production of inventory system reports**Criteria 11.15A.2.1**

Regular inventory reports prepared in accordance with standard operating procedure.

Assessor guide: observe that –

Regular inventory reports are prepared in accordance with standard operating procedures.

Assessor guide: confirm that –

The inventory reporting requirements can be identified. The frequency with which inventory reports are to be completed can be identified.

Criteria 11.15A.2.2

Special stock level and other inventory reports prepared as required.

Assessor guide: observe that –

Where appropriate, special stock level and other inventory reports are prepared in accordance with standard operating procedures.

Assessor guide: confirm that –

Where appropriate, the requirements of the special reports can be identified. The sources of stock/inventory information for inclusion in reports can be identified. Customer satisfaction with inventory system reports is sought.

Criteria 11.15A.2.3

Adjustments to inventory reporting procedures made to meet internal and external customer requirements.

Assessor guide: observe that –

Changes in procedures are discussed with relevant workplace staff Any adjustment produce a positive outcome.

Assessor guide: confirm that –

Where appropriate, the adjustments to be made to the inventory reporting procedures can be identified. Where appropriate, the reasons for making the adjustments to the inventory reporting procedures can be explained. The procedures for implementing the adjustments to the inventory reporting procedures can be given.

Element 11.15A.3 Analyse inventory reports**Criteria 11.15A.3.1**

Reconciliation of inventory records against production or purchase of sales records undertaken in accordance with standard operating procedure.

Assessor guide: observe that –

Inventory records are reconciled in accordance with standard operating procedures.

Assessor guide: confirm that –

The inventory reconciliation procedures can be identified. The sources of information/data necessary to enable the inventory records to be reconciled can be identified.

Criteria 11.15A.3.2

Major trends, not requiring sophisticated statistical analysis, identified.

Assessor guide: observe that –

Assessor guide: confirm that –

The trends that can be identified/ interpreted from inventory records can be identified. The reasons for monitoring trends contained in inventory records can be explained. Given sample inventory reports, major trends can be identified.

Criteria 11.15A.3.3

Inventory system relationship to manufacturing process e.g J.I.T. (Just-in-time) understood.

Assessor guide: observe that –

Assessor guide: confirm that –

The inventory requirements of manufacturing processes can be identified. The effects of insufficient/excessive inventory on the manufacturing process and organisational viability can be explained.

Range statement

This unit applies to the supervision of a warehouse inventory system used by other warehouse, production, maintenance or management personnel. Records can be computer based or manual. If computer based records are used, relevant computer units may also need to be accessed. Where skills are required to maintain/supervise application of quality procedures, then Unit 15.12B (Maintain/supervise application of quality procedures) should be selected.

Evidence guide

Assessment context

This unit should be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the management of warehouse inventory systems or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 11.16A A Order materials

Band – Specialisation band A

Field – Materials handling

Unit Weight 2

Element 11.16A.1 Prepare purchase order/list

Criteria 11.16A.1.1

Purchase order/list prepared to standard operating procedure.

Assessor guide: observe that –

Purchase orders/lists are prepared in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for ordering materials/components can be identified. The appropriate purchase order forms can be identified.

Criteria 11.16A.1.2

Material specifications, price limitations, quantities and delivery requirements determined from instructions, requisitions etc.

Assessor guide: observe that –

All relevant instructions, requisitions, technical drawings and/or bills of material are obtained in accordance with work place procedures.

Assessor guide: confirm that –

The material/component specifications can be identified. The sources of additional information/advice with respect to the material/component specification can be identified. The quantities of materials/components to be ordered can be identified. The price limitations on materials/components to be purchased can be identified. The delivery requirements can be identified.

Element 11.16A.2 Purchase order

Criteria 11.16A.2.1

Supplier/vendor informed of requirements and specifications according to standard operating procedure.

Assessor guide: observe that –

The supplier/vendor is informed of the material/component requirements and specifications in accordance with standard operating procedures.

Assessor guide: confirm that –

The appropriate supplier(s)/ vendor(s) of a range of materials/components can be identified. The procedures to be followed in informing supplier(s)/vendor(s) of the purchase requirements can be given.

Criteria 11.16A.2.2

Supplier/vendor followed up to achieve delivery as required.

Assessor guide: observe that –

Where appropriate, the supplier/vendor is contacted to ensure the materials/components are delivered as required. Where appropriate, the relevant personnel are informed of the supplier/vendor's inability to supply the materials/components as required.

Assessor guide: confirm that –

The delivery requirements can be identified. The procedures to be followed if the required delivery cannot be achieved can be given. The person(s) to be informed of the inability of a supplier/vendor to supply the materials/components by the required time.

Criteria 11.16A.2.3

Where appropriate, goods directly received and checked for damage.

Assessor guide: observe that –

Where appropriate, goods are received in accordance with standard operating procedures. Where appropriate, goods are checked visually for faults and/or damage. Where appropriate, faults and/or damaged goods are rejected in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for receiving goods can be identified. The checks to be undertaken of materials/components delivered can be identified. Common defects/damage to materials/components can be identified. The procedures for dealing with faulty or damaged materials/ components can be identified.

Criteria 11.16A.2.4

Records/files completed accurately according to standard operating procedure.

Assessor guide: observe that –

All relevant records/files are accurately completed/maintained in accordance with standard operating procedures.

Assessor guide: confirm that –

The records/files of ordered goods to be completed/maintained can be identified. The recording/filing procedures can be identified.

Range statement

This unit applies to purchasing activities carried out by other than the purchasing officer eg: maintenance, service, stores, warehouse personnel. The work is undertaken autonomously or as part of team.

Evidence guide

Assessment context

This unit should be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the ordering of materials or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 11.17A A Organise and lead stocktakes

Band – Specialisation band A

Field – Materials handling

Unit Weight 4

Pre-requisite units - Path 1

2.7C10 Perform computations - basic

11.7A Administer inventory procedures

Element 11.17A.1 Plan stocktake

Criteria 11.17A.1.1

Inventory lists prepared and distributed.

Assessor guide: observe that –

Inventory lists are prepared and distributed in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for printing and distributing inventory lists can be given. The personnel participating in the stocktake can be identified.

Criteria 11.17A.1.2

Warehouse and/or production areas allocated to each individual or team assisting in stocktake.

Assessor guide: observe that –

Each individual/team is assigned a section of the warehouse/production area in which to undertake the stocktake.

Assessor guide: confirm that –

The areas of the warehouse and/or production areas to which individuals or teams are to be assigned can be identified.

Element 11.17A.2 Brief participants in stocktake

Criteria 11.17A.2.1

Clear directions and appropriate documentation and equipment provided to each individual or team participating in stocktake.

Assessor guide: observe that –

All participants in the stocktake are briefed on the requirements of the stocktake. All participants are provided with the appropriate documentation and equipment to undertake the stocktake.

Assessor guide: confirm that –

The directions to participants can be identified. The necessary documentation and equipment to carry out the stocktake can be identified.

Element 11.17A.3 Generate stocktake reports

Criteria 11.17A.3.1

Written or computer reports collected from individuals or teams on stock counts.

Assessor guide: observe that –

The stock counts are collected from the individuals/teams.

Assessor guide: confirm that –

The information to be collected from individuals/teams can be identified.

Criteria 11.17A.3.2

Inventory data is confirmed to match stock levels.

Assessor guide: observe that –

The inventory data is compared with stock counts in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for comparing inventory data with stock counts/levels can be given.

Criteria 11.17A.3.3

Stock discrepancy report prepared and distributed according to standard operating procedure.

Assessor guide: observe that –

Where appropriate, stock discrepancy reports are prepared and distributed in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for preparing and distributing stock discrepancy reports can be given.

Element 11.17A.4 Adjust inventory documentation**Criteria 11.17A.4.1**

Inventory documentation is reconciled to match physical stock in accordance with regulatory and operating procedures.

Assessor guide: observe that –

Inventory documentation is reconciled with physical stock levels in accordance with regulations and standard operating procedures.

Assessor guide: confirm that –

The regulatory requirements with respect to inventory reconciliation can be identified. The procedures for reconciling inventory documentation with physical stock levels can be given.

Criteria 11.17A.4.2

Stocktake information is reconciled with audit requirements.

Assessor guide: observe that –

Stocktake information is reconciled with audit requirements.

Assessor guide: confirm that –

The audit requirements with respect to stock levels can be identified.

Range statement

This unit covers the skills involved in organising and leading stocktakes in accordance with enterprise stocktaking policies, practices and procedures. Stocktakes can be undertaken using a variety of equipment including calculators, scanners and portable computers. All work undertaken to legislative and regulatory requirements.

Evidence guide

Assessment context

This unit should be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with stocktaking or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 11.18A A Organise and maintain warehouse stock receipt and/or dispatch system

Band – Specialisation band A

Field – Materials handling

Unit Weight 6

Pre-requisite units - Path 1

11.6A Production packaging

11.11A Manual handling

11.13A Undertake warehouse receipt process

Pre-requisite units - Path 2

11.8A Package materials (stores and warehouse)

11.11A Manual handling

11.13A Undertake warehouse receipt process

Pre-requisite units - Path 3

11.6A Production packaging

11.11A Manual handling

11.14A Undertake warehouse despatch process

Pre-requisite units - Path 4

11.8A Package materials (stores and warehouse)

11.11A Manual handling

11.14A Undertake warehouse despatch process

Element 11.18A.1 Allocate/coordinate work activities in receipt and/or despatch areas

Criteria 11.18A.1.1

Equipment and/or staff are allocated to meet receipt and/or despatch schedules.

Assessor guide: observe that –

Appropriate staff and equipment are allocated to stock receipt and despatch areas to meet the work schedules.

Assessor guide: confirm that –

The receipt and despatch schedules can be identified. The staff and equipment required to meet those schedules can be identified.

Criteria 11.18A.1.2

Appropriate documentation distributed and collected.

Assessor guide: observe that –

The appropriate documentation is distributed and collected.

Assessor guide: confirm that –

The appropriate documentation and its purpose can be identified.

Criteria 11.18A.1.3

Contingency procedures developed and implemented for receipt and despatch problems.

Assessor guide: observe that –

Contingency procedures are in place to overcome receipt and despatch problems. Where appropriate, the contingency procedures are implemented to overcome receipt and/or despatch problems.

Assessor guide: confirm that –

The contingency procedures to overcome receipt and despatch problems can be given. The reasons for having contingency plans can be explained. The types of receipt and despatch problems that the contingency plans are developed to overcome can be identified.

Element 11.18A.2 Maintain stock receipt and/or dispatch system**Criteria 11.18A.2.1**

Information is provided and extracted accurately according to standard operating procedure.

Assessor guide: observe that –

The relevant information is accurately put into the stock receipt and dispatch system in accordance with standard operating procedures. The relevant information can be extracted from the receipt and dispatch system in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for the input and extraction of information can be given. The information to be input and/or extracted can be identified.

Criteria 11.18A.2.2

Receipt and dispatch reports produced as required.

Assessor guide: observe that –

Where appropriate, receipt and dispatch reports are produced in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for preparing receipt and dispatch reports can be given.

Criteria 11.18A.2.3

Modifications to dispatch and/or receipt system are made according to standard operating procedure.

Assessor guide: observe that –

Where appropriate, the dispatch and/or receipt systems are modified in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for modifying the dispatch/receipt system can be given. The reasons for modifying the dispatch/receipt system can be identified.

Criteria 11.18A.2.4

Major problems with receipt and/or dispatch system identified and reported according to standard operating procedure.

Assessor guide: observe that –

Where appropriate, major problems with the receipt/dispatch system are reported to the appropriate authority in accordance with standard operating procedures.

Assessor guide: confirm that –

Typical problems experienced in stock receipt/dispatch systems can be identified. The person to whom major problems with stock receipt/dispatch systems are to be reported can be identified.

Criteria 11.18A.2.5

Participates in continuous improvement of dispatch and/or receipt systems.

Assessor guide: observe that –

The implementation of improvements in the stock receipt/dispatch system is planned in accordance with standard operating procedures.

Assessor guide: confirm that –

Improvements in the stock receipt and dispatch system can be identified. The procedures for changing the stock receipt and dispatch system can be given.

Range statement

Organising and maintaining warehouse receipt and dispatch areas includes the configuration of receipt and dispatch areas, taking into account customer and supplier needs, documentation and system requirements and enterprise quality practices and procedures. All work undertaken to legislative and regulatory requirements. Special requirements of products, materials and location are taken into account.

Evidence guide

Assessment context

This unit should be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with warehouse stock receipt and dispatch systems or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 11.19A A Undertake tool store procedures

Band – Specialisation band A

Field – Materials handling

Unit Weight 4

Pre-requisite units - Path 1

2.7C10 Perform computations - basic

11.13A Undertake warehouse receipt process

11.7A Administer inventory procedures

11.11A Manual handling

Element 11.19A.1 Order tooling

Criteria 11.19A.1.1

Tooling requirements are identified and consolidated from order documentation and liaison with trade and production personnel according to standard operating procedure.

Assessor guide: observe that –

Where appropriate, order documents are obtained in accordance with workplace procedures. Relevant trade and production personnel are consulted and their tooling requirements identified in accordance with work place procedures. The tooling requirements identified are consolidated in accordance with standard operating procedures.

Assessor guide: confirm that –

The relevant order documents can be identified. The relevant personnel to be consulted with respect to their tooling requirements can be identified. The procedures for determining tooling requirements can be given.

Criteria 11.19A.1.2

Appropriate tooling identified from supplier catalogues and manuals, including correct tooling range by size, hardness, quality etc.

Assessor guide: observe that –

All relevant manuals, data sheets, supplier catalogues, tooling specifications and instructions are obtained in accordance with work place procedures.

Assessor guide: confirm that –

The appropriate tooling can be identified. The tooling specifications can be identified.

Criteria 11.19A.1.3

Tooling order placed according to standard operating procedure.

Assessor guide: observe that –

Tooling orders are placed with appropriate suppliers in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for ordering tooling can be identified. Preferred/contracted suppliers can be identified. Where appropriate, ordering limitations and/or authorisation requirements can be identified. Where appropriate, orders are authorised by the relevant authority.

Element 11.19A.2 Tooling orders received**Criteria 11.19A.2.1**

Tooling orders received from main receipt warehouse or direct from supplier according to standard operating procedure.

Assessor guide: observe that –

Tooling orders are received in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for the receipt of ordered tooling can be identified.

Criteria 11.19A.2.2

Tooling unpacked and placed in correct location.

Assessor guide: observe that –

Tooling is unpacked and checked for conformance to order and specifications in accordance with standard operating procedures. The tooling is appropriately stored in the correct location in accordance with standard operating procedures.

Assessor guide: confirm that –

The storage requirements and location of a range of tools can be identified.

Element 11.19A.3 Tooling maintained**Criteria 11.19A.3.1**

Tooling cleaned and protected where appropriate.

Assessor guide: observe that –

Where appropriate, tooling is cleaned and protected in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for cleaning a range of tooling can be given. The procedures for applying protective coatings, packaging etc. for a range of tooling can be identified. The reasons for cleaning and protecting tooling can be explained.

Criteria 11.19A.3.2

Tooling supplies monitored to ensure maintenance of contingency stock.

Assessor guide: observe that –

Tooling stock levels are maintained to ensure adequacy of supply to trade and production personnel by monitoring tool store records and stock levels in accordance with standard operating procedures.

Assessor guide: confirm that –

Where appropriate, minimum stock levels of tools can be identified. The rate of consumption of a range of tooling can be identified from tool store records. The lead time for the supply of a range of tooling can be identified from tool store records.

Element 11.19A.4 Tooling distributed**Criteria 11.19A.4.1**

Tooling issued to users according to standard operating procedure.

Assessor guide: observe that –

Tooling is issued in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for issuing tooling to trade and production personnel can be identified.

Criteria 11.19A.4.2

Enterprise documentation procedures followed.

Assessor guide: observe that –

Where appropriate, enterprise documentation is completed in accordance with standard operating procedures.

Assessor guide: confirm that –

Where appropriate, documentation to be completed on tooling issued can be identified.

Criteria 11.19A.4.3

Procedures against unauthorised use of tooling established and/or followed.

Assessor guide: observe that –

Where appropriate, procedures to prevent unauthorised use of tooling are developed and implemented. Tooling is issued ensuring that procedures aimed at preventing unauthorised use of tooling are followed.

Assessor guide: confirm that –

The persons authorised to access tooling from the tool store can be identified. Where appropriate, any limitations on access to tooling can be identified. Where appropriate, procedures to prevent unauthorised use of tooling can be identified.

Range statement

This unit applies to the management and storage of enterprise owned tooling and associated consumable items used in engineering. Tooling includes hand tools, cutting tips for lathes, mills and other metal removal machines, grinding wheels, special steel etc. Tooling can be permanent or disposable. The work would normally be undertaken in a specialist store or warehouse. Engineering knowledge and drawing interpretation skills would often be required and should be accessed from appropriate units.

Evidence guide

Assessment context

This unit should be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with tool store procedures or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 11.20A A Perform advanced warehouse computer operations

Band – Specialisation band A

Field – Materials handling

Unit Weight 4

Pre-requisite units - Path 1

2.9C10 Perform computer operations

Element 11.20A.1 Identify programs appropriate to purpose

Criteria 11.20A.1.1

Range of programs available on system identified.

Assessor guide: observe that –

Assessor guide: confirm that –

The range of programs available on the computer system can be identified. The application of each program can be identified.

Criteria 11.20A.1.2

Correct selection of word processing, spreadsheet, database or special purpose program made.

Assessor guide: observe that –

The correct program can be selected for a range of given applications/requirements.

Assessor guide: confirm that –

Element 11.20A.2 Manipulate data for analysis and/or report generation

Criteria 11.20A.2.1

Data manipulated through merging of files, transfer of information between programs or other strategies to generate desired outcome.

Assessor guide: observe that –

Data is manipulated in accordance with standard operating procedures for analysis and/or report generation.

Assessor guide: confirm that –

The data required for analysis or report generation can be identified. The procedures for performing the following operations can be given: - merging of files - transfer of information between programs.

Element 11.20A.3 Edit program

Criteria 11.20A.3.1

Categories in warehouse information system created/deleted to cater for changes in stock lines.

Assessor guide: observe that –

Categories are created/deleted in the warehouse information system in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for creating/deleting categories within the warehouse information system can be given. The reasons for creating/deleting categories within the warehouse information system can be given.

Criteria 11.20A.3.2

Report formats generated and/or modified.

Assessor guide: observe that –

Report formats are generated and/or modified in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for generating reports can be given. The procedures for modifying reports can be given. The reasons for modifying report formats can be identified.

Criteria 11.20A.3.3

Access control requirements identified.

Assessor guide: observe that –

Access to the warehouse information system is controlled in accordance with standard operating procedures.

Assessor guide: confirm that –

The requirements for controlling access to the information system can be identified. The procedures for controlling access to the warehouse information system can be given.

Range statement

This unit applies to operations on warehouse computer information systems beyond that covered by Unit 2.9C10 (Perform computer operations) and relevant material handling units; it identifies the level of computer skills needed rather than inventory system or product knowledge required. There is to be further development of units covering computer competencies which may result in this unit being broadened to cover a wider range of areas or being changed.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with warehouse computer operations or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 11.21A A Advanced operation of load shifting equipment

Band – Specialisation band A

Field – Materials handling

Unit Weight 2

Pre-requisite units - Path 1

11.10A Operate mobile load shifting equipment

Element 11.21A.1 Determine lifting and loading requirements

Criteria 11.21A.1.1

Load is identified and checked against safe working load of final position/location and/or relevant specifications or regulations.

Assessor guide: observe that –

The load is checked against safe working loads, specifications and/or regulations in accordance with work site procedures.

Assessor guide: confirm that –

The safe working load of truck and/or containers can be identified. The load is identified and its weight confirmed.

Criteria 11.21A.1.2

Special handling requirements of load identified, if applicable.

Assessor guide: observe that –

Assessor guide: confirm that –

Any special handling requirements of the load can be identified.

Criteria 11.21A.1.3

Load is lifted correctly and placed in final position/location to achieve specified balance of load.

Assessor guide: observe that –

The load is placed in such a manner that the required load balance across the length of the truck or container is achieved in accordance with work site procedures.

Assessor guide: confirm that –

Load distribution requirements of the truck or container can be identified.

Element 11.21A.2 Work in confined spaces or conditions of restricted visibility

Criteria 11.21A.2.1

Load is collected and manoeuvred without damage to load or collision with obstacles according to standard operating procedure.

Assessor guide: observe that –

The load is raised and manoeuvred without damage to the load or collision with obstacles in accordance with work site procedures.

Assessor guide: confirm that –

The hazards associated with moving loads in confined spaces can be identified.

Element 11.21A.3 Identify and carry loads that require special care**Criteria 11.21A.3.1**

Loads requiring special care are identified.

Assessor guide: observe that –

Assessor guide: confirm that –

The special handling requirements of loads are identified.
Examples of loads requiring special care can be given.

Criteria 11.21A.3.2

Loads are carried in accordance with special requirements of product according to standard operating procedures and/or regulations.

Assessor guide: observe that –

The loads are moved in accordance with any special handling requirements, regulatory requirements and work site procedures.

Assessor guide: confirm that –

Element 11.21A.4 Operate forklifts in special traffic conditions**Criteria 11.21A.4.1**

Forklifts are operated in areas of heavy traffic.

Assessor guide: observe that –

Loads are moved safely and efficiently in areas of heavy traffic in accordance with work site procedures.

Assessor guide: confirm that –

The hazards associated with the operation of fork lifts in areas of heavy traffic can be identified.

Criteria 11.21A.4.2

Forklifts are operated over difficult or uneven surfaces.

Assessor guide: observe that –

Loads are moved safely and efficiently over difficult or uneven terrain in accordance with work site procedures.

Assessor guide: confirm that –

The hazards associated with the operation of fork lifts over difficult or uneven terrain can be identified.

Criteria 11.21A.4.3

Forklifts operated in areas shared with the general public, as required.

Assessor guide: observe that –

Loads are moved safely and efficiently in areas shared with the general public in accordance with regulatory requirements and work site procedures.

Assessor guide: confirm that –

The hazards associated with the operation of fork lifts in areas shared with the general public can be identified.
The regulatory requirements associated with the operation of fork lifts in areas shared with the general public can be identified.

Range statement

This unit applies to advanced forklift and loadshifting skills above those required for general operation. To be credited with this unit it is expected that an employee would be competent in situations indicated by all elements and performance criteria. This unit is intended to cover load shifting applications where special purpose equipment/accessories requiring advanced operational skills, eg: heavy, out of balance, awkward and irregular shaped loads traversing over rough, broken or uneven surfaces, high rise situations, are used. All work undertaken to regulatory and legislative requirements.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the operation of load shifting equipment, or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment, the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 11.22A A Operate fixed/moveable load shifting equipment

Band – Specialisation band A

Field – Materials handling

Unit Weight 4

Element 11.22A.1 Conduct routine operation and safety checks of load shifting equipment

Criteria 11.22A.1.1

Operational principles of load shifting equipment understood.

Assessor guide: observe that –

Assessor guide: confirm that –

The operational principles of the load shifting equipment can be explained.

Criteria 11.22A.1.2

Routine pre-use checks undertaken in accordance with manufacturer's specifications and regulatory safety requirements.

Assessor guide: observe that –

Routine pre-use checks are carried out in accordance with manufacturer's and regulatory requirements and standard operating procedures.

Assessor guide: confirm that –

The pre-use checks to be undertaken for the particular load shifting device can be identified.

Criteria 11.22A.1.3

Non-compliance with specification reported using standard operating procedures.

Assessor guide: observe that –

Variations of the load shifting device from manufacturer's specifications are reported to the appropriate person in accordance with standard operating procedures.

Assessor guide: confirm that –

The manufacturer's specifications for the load shifting device can be identified. The person to whom variations from specifications are to be reported can be identified.

Element 11.22A.2 Pick up loads

Criteria 11.22A.2.1

Appropriate load shifting device selected.

Assessor guide: observe that –

Assessor guide: confirm that –

Examples of load shifting devices appropriate to the loading task and lift can be given. The most appropriate load shifting device can be identified. The reasons for selecting the chosen load shifting device can be explained.

Criteria 11.22A.2.2

Load shifting device operated within design specifications and safe working load.

Assessor guide: observe that –

The load shifting device is operated within design specifications and safe working loads.

Assessor guide: confirm that –

The safe working load and any design limitations applying to the selected load shifting device can be identified.

Criteria 11.22A.2.3

Load is lifted/rolled, ensuring balance, vision of operation, safety of personnel and protection of load.

Assessor guide: observe that –

The load lifted/rolled is balanced, the operator has good vision of the area of operation and the load is adequately protected in accordance with standard operating procedures.

Assessor guide: confirm that –

The hazards with respect to the load, the operator and others when loads are being lifted can be identified. Methods of protecting the load during the relocation of the load can be identified.

Element 11.22A.3 Shift load**Criteria 11.22A.3.1**

Where required, load moved at appropriate and safe speed using safe and efficient path.

Assessor guide: observe that –

The load is moved safely and efficiently to its destination in accordance with standard operating procedures.

Assessor guide: confirm that –

The hazards associated with the movement of loads can be identified. The most direct, safe path for movement of the load can be identified.

Criteria 11.22A.3.2

Path of movement is monitored for obstacles and hazards during shifting process.

Assessor guide: observe that –

The load is always moved along a path that is free of obstacles and hazards.

Assessor guide: confirm that –

Potential obstacles and hazards that would affect the safety of the path of movement of the load can be identified.

Element 11.22A.4 Place load**Criteria 11.22A.4.1**

Loads are lowered at appropriate and safe rate.

Assessor guide: observe that –

Loads are lowered at an appropriate and safe rate in accordance with standard operating procedures.

Assessor guide: confirm that –

The effect of load lowering rates on the safety of the load, the individual and other personnel can be explained.

Criteria 11.22A.4.2

Loads are placed ensuring stability, protection of material and avoidance of hazards on site.

Assessor guide: observe that –

All loads are placed safely and the stability and protection of the load material is ensured at all times in accordance with standard operating procedures.

Assessor guide: confirm that –

The requirements for load protection can be identified. The hazards to the load, the individual and other personnel during the placing of loads can be identified.

Range statement

Work undertaken autonomously or in a team environment. Load shifting equipment is operated within the limits of manufacturer's recommended procedures and safe working loads. Movable and fixed load shifting equipment may include pendant cranes, yard, workshop and store travelling overhead cranes, monorail hoists and chain blocks (manual, air or electric etc.), pivoting slewing jib rails etc. All work and work practices undertaken to regulatory and legislative requirements. This unit applies to load shifting/lifting where knowledge of codes and signals is not required. When using dedicated lifting equipment or devices where decisions regarding loads and methods of attachment are not required, Unit 11.11A (Manual handling) should be selected.

Evidence guide**Assessment context**

This unit should be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the operation of fixed/moveable load shifting equipment or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 12.1A A Use comparison and basic measuring devices

Band – Specialisation band A

Field – Measurement

Unit Weight 2

Element 12.1A.1 Select and use comparison and/or basic measuring devices

Criteria 12.1A.1.1

Identify and select appropriate measuring devices to undertake required comparison or measurement using standard operating procedures.

Assessor guide: observe that –

The correct device is selected to sort or categorise items in accordance with standard operating procedures.

Assessor guide: confirm that –

The correct device for comparison or measurement to be undertaken can be identified and justified as meeting comparison or measurement need.

Criteria 12.1A.1.2

Undertake measurement or sorting of items using comparison and/or basic measuring device.

Assessor guide: observe that –

All devices are correctly handled and appropriately applied in undertaking the comparison or measurement.

Assessor guide: confirm that –

The application of the device can be identified. The procedures for the correct use of devices can be identified.

Element 12.1A.2 Maintain comparison and/or basic measuring devices

Criteria 12.1A.2.1

Ensure basic care and storage to manufacturer's standards or standard operating procedures.

Assessor guide: observe that –

The preset device is stored and maintained in accordance with manufacturer's/standard operating procedures.

Assessor guide: confirm that –

The procedures for maintaining and storing the preset device can be identified.

Range statement

Work undertaken autonomously or as part of team work. Comparison measurements undertaken in production environment or at work station. These may include length, angle, size, temperature, pressure, weight, voltage, resistance and amperage. Comparison devices may include go-no-go, thread angle and taper gauges, temperature gauges, pressure gauges, measuring gauges, weight scales, overlay indicator, digital devices, preset verniers and micrometers. All comparative measurements undertaken to standard operating procedures and to regulatory and legislative requirements. Basic measuring devices may include linear measuring devices, measuring to within 1mm graduation. This may include rules, tapes and retractable tapes. This unit should not be selected if Unit 2.5C11 (Measure with graduated devices) has already been selected.

Evidence guide

Assessment context

This unit should be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the use of preset comparison measuring devices or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 12.2A A Electrical/electronic measurement

Band – Specialisation band A

Field – Measurement

Unit Weight 2

Element 12.2A.1 Use electro-measuring devices to measure variables

Criteria 12.2A.1.1

Appropriate device or equipment and setting selected to achieve required outcome.

Assessor guide: observe that –

The appropriate electro-measuring device and setting is selected and used in accordance with standard operating procedures to obtain specified electrical measurements.

Assessor guide: confirm that –

The applications of a range of electro-measuring devices can be given. The application of the settings on each electro-measuring device can be explained. For a given range of measurements to be taken, the appropriate device and setting can be identified. The procedures for obtaining electrical measurements can be identified.

Criteria 12.2A.1.2

Appropriate connections made to achieve required outcome according to standard operating procedure.

Assessor guide: observe that –

The appropriate connections are made between the electro-measuring device(s) and the circuitry in accordance with standard operating procedures for taking specified electrical measurements.

Assessor guide: confirm that –

The connections to be made between the electro-measuring device and the circuitry to be tested can be identified for each type of electrical measurement. The procedures for connecting electro-measuring devices to circuitry can be identified.

Criteria 12.2A.1.3

Readings obtained and interpreted correctly Conversion made where necessary, into the units of measurement required.

Assessor guide: observe that –

The specified electrical measurements are obtained and correctly interpreted in accordance with standard operating procedures. Where appropriate, the readings taken are converted into the units of measurement required.

Assessor guide: confirm that –

The correct scale for each setting on the electro-measuring device can be identified. Where appropriate, the scale factor to be applied to readings taken from the electro-measuring device can be identified. The units applying to electrical and electronic measurements can be identified.

Element 12.2A.2 Maintain electro devices**Criteria 12.2A.2.1**

Routine care and storage of devices undertaken to manufacturer's specifications or standard operating procedures.

Assessor guide: observe that –

All electro-measuring devices are maintained and stored in accordance with manufacturer's specifications and standard operating procedures.

Assessor guide: confirm that –

The maintenance and storage requirements of a range of electro-measuring devices can be identified. The procedures for maintaining and storing a range of electro-measuring devices can be identified. The specifications of selected electro-measuring devices can be identified.

Range statement

This unit covers the measurement of voltage, current, resistance, power, frequency etc. on AC and DC circuits up to 1000v, using appropriate measuring devices. Measuring devices may include analogue/digital multimeters, tong testers, oscilloscopes, potentiometers, etc. Electrical/electronic measuring devices may require the connection or disconnection of circuitry. Adjustment of measuring devices may include zero and linear adjustment. Work may be undertaken autonomously or as part of a team. For simple measurement tasks such as reading of fixed devices, testing continuity, and tasks requiring the use of devices mounted in measuring jigs etc. Unit 2.5C11 (Measure with graduated devices) and/or Unit 12.1A (Use comparison and basic measuring devices) should be considered.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the taking of electrical/electronic measurements or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 12.3A A Precision mechanical measurement

Band – Specialisation band A

Field – Measurement

Unit Weight 2

Notes - This unit has dual status and is to be regarded as both a Specialisation band A unit and Specialisation band B unit for progression to C7 (AQF level IV)

Element 12.3A.1 Use precision measurement equipment

Criteria 12.3A.1.1

Select appropriate precision equipment to achieve specified outcome.

Assessor guide: observe that –

Assessor guide: confirm that –

The application of a range of precision mechanical measuring equipment can be given. For a given range of measurements to be taken the appropriate precision mechanical measuring device can be identified. The reasons for selecting the chosen precision mechanical measuring device can be explained.

Criteria 12.3A.1.2

Correct and appropriate measuring techniques used.

Assessor guide: observe that –

The appropriate precision mechanical measuring device is selected and used in accordance with standard operating procedures/techniques to obtain specified mechanical measurements.

Assessor guide: confirm that –

The procedures/techniques for obtaining a range of mechanical measurements can be identified.

Criteria 12.3A.1.3

Measure accurately to finest graduation of instrument.

Assessor guide: observe that –

A range of precision mechanical measuring devices can be read accurately to the finest graduation of the device in accordance with standard operating procedures.

Assessor guide: confirm that –

The accuracy to which a range of precision mechanical measuring devices can be read can be identified. The procedures for reading graduated mechanical measuring devices can be given.

Criteria 12.3A.1.4

Readings and measurements are interpreted correctly and accurately.

Assessor guide: observe that –

For a range of precision mechanical measuring devices, all readings and measurements are interpreted correctly and accurately.

Assessor guide: confirm that –

The units of measurement used in conjunction with precision mechanical measurement can be identified.

Element 12.3A.2 Set comparative measuring devices**Criteria 12.3A.2.1**

Equipment set to specifications utilising manufacturer's or standard operating procedures and techniques.

Assessor guide: observe that –

Where appropriate, measuring devices are set to specification using appropriate tools and equipment, in accordance with manufacturer's/ standard operating procedures.

Assessor guide: confirm that –

The procedures for setting comparative measuring devices can be identified. The specifications of the equipment to be set can be identified. The tools and equipment to be used in setting comparative measuring devices can be identified.

Element 12.3A.3 Maintain precision equipment**Criteria 12.3A.3.1**

Measuring equipment adjusted and maintained to required accuracy, utilising manufacturer's or standard operating procedures and techniques.

Assessor guide: observe that –

All precision mechanical measuring devices are maintained and adjusted, where appropriate, in accordance with manufacturer's/standard operating procedures.

Assessor guide: confirm that –

The adjustments that can be made to a range of precision mechanical measuring devices can be identified. The procedures for adjusting and maintaining a range of precision mechanical measuring devices can be given.

Criteria 12.3A.3.2

Care and storage of equipment undertaken to manufacturer's specifications or standard operating procedures.

Assessor guide: observe that –

All precision mechanical measuring devices are stored in accordance with manufacturer's specifications and standard operating procedures.

Assessor guide: confirm that –

The procedures for storing precision mechanical measuring devices can be given. The specifications of precision mechanical measuring devices can be identified.

Range statement

Work undertaken autonomously or as part of team environment. Work undertaken in field (in situ) or workshop/laboratory environment. This unit covers comprehensive measuring skills where judgement is required in the selection of the most appropriate techniques/devices and results interpreted/analysed. Measurement undertaken may include length, circular, straightness, flatness, hardness, angles, finishes, textures, roundness, squareness, alignment and coordinate measurement on equipment where equipment is fabricated, maintained or repaired. Applications may include precision and/or complex use of slip gauges, engineering squares, angle deckers, sine bars, angle gauges, polygons, dividing heads, rotary tables, precision levels, micrometers, height gauges, hardness testers, and texture measuring equipment etc. All specifications obtained from engineering drawings and data sheets and/or manufacturer's instructions/data. All measurement/test procedures undertaken to standard operating procedures or manufacturer's recommended procedure. All work and work practices undertaken to regulatory and legislative requirements.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with precision mechanical measurements or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 12.4A A Precision electrical/electronic measurement

Band – Specialisation band A

Field – Measurement

Unit Weight 4

Notes - It is recommended that this unit be assessed in conjunction with electric and/or electronic competency units. This unit has dual status and is to be regarded as both a Specialisation band A unit and Specialisation band B unit for progression to C

Element 12.4A.1 Use equipment for precision measurement

Criteria 12.4A.1.1

Specifications interpreted accurately from drawings, instructions.

Assessor guide: observe that –

All relevant drawings, specifications, data sheets and instructions obtained in accordance with standard operating procedures.

Assessor guide: confirm that –

The specifications of the circuitry and/or components to be tested can be identified.

Criteria 12.4A.1.2

Appropriate equipment selected to achieve specified outcome.

Assessor guide: observe that –

Assessor guide: confirm that –

The application of a range of precision electrical/electronic measuring devices can be given. The appropriate precision electrical/ electronic measuring device(s) to undertake the required measurements can be identified. The reasons for selecting the chosen precision electrical/electronic measuring device can be explained.

Criteria 12.4A.1.3

Correct and appropriate measuring technique used.

Assessor guide: observe that –

The appropriate precision electrical/ electronic measuring device is selected and used in accordance with standard operating procedures/ techniques to obtain specified electrical/electronic measurements.

Assessor guide: confirm that –

The procedures/techniques for obtaining a range of electrical/ electronic measurements can be given.

Criteria 12.4A.1.4

Readings and measurements are interpreted correctly and accurately.

Assessor guide: observe that –

For a range of precision electrical/ electronic measuring devices, all readings and measurements are interpreted correctly and accurately.

Assessor guide: confirm that –

The units of measurement used in conjunction with precision electrical/electronic measurement can be identified.

Element 12.4A.2 Set measuring devices**Criteria 12.4A.2.1**

Equipment set up to specifications utilising manufacturer's or standard operating techniques.

Assessor guide: observe that –

Precision electrical/electronic measuring devices are set to specification using appropriate tools and equipment, in accordance with manufacturer's/standard operating procedures.

Assessor guide: confirm that –

The procedure for setting a range of precision electrical/electronic measuring devices can be identified. The specifications of the equipment to be set can be identified. The tools and equipment to be used in setting precision electrical/ electronic measuring devices can be identified.

Element 12.4A.3 Maintain precision equipment**Criteria 12.4A.3.1**

Measuring equipment adjusted and maintained to required accuracy, utilising manufacturer's specifications or standard operating techniques.

Assessor guide: observe that –

All precision electrical/electronic measuring devices are maintained and adjusted, where appropriate, in accordance with manufacturer's/ standard operating procedures.

Assessor guide: confirm that –

The adjustments that can be made to a range of precision electrical/ electronic measuring devices can be identified. The procedures for adjusting and maintaining a range of precision electrical/electronic measuring devices can be given.

Criteria 12.4A.3.2

Care and storage of equipment undertaken to manufacturer's specifications or standard operating procedures.

Assessor guide: observe that –

All precision electrical/electronic measuring devices are stored in accordance with manufacturer's specifications and standard operating procedures.

Assessor guide: confirm that –

The procedures for storing precision electrical/electronic measuring devices can be given. The specifications of precision electrical/electronic measuring devices can be identified.

Range statement

Work undertaken autonomously or as part of team environment. Work undertaken in field (in situ) and/or workshop/laboratory environment. This unit covers the definition of what needs to be measured, the selection of appropriate measuring devices and calibration and care of devices to obtain accurate, precision measurements. Measurements may include peak and transient voltages, transient frequencies, digital wave form analysis etc. Measurements include a range of frequencies and may be undertaken on full range of electrical/electronic equipment including A.C., D.C. analog and digital equipment, microwave etc. Precision measuring/test equipment may include analog and digital meters, cathode ray oscilloscope, bridges and potentiometers, wattmeters and digital probes etc. All specifications obtained from circuit drawings, engineering data sheets and/or manufacturer's instructions/data. All measurement test procedures undertaken to standard operating procedures or manufacturer's recommended procedures. All work and work practices undertaken to regulatory and legislative requirements.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with precision electrical/electronic measurement or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 12.5B A Calibrating measuring equipment

Band – Specialisation band B

Field – Measurement

Unit Weight 6

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices

12.3A Precision mechanical measurement

Pre-requisite units - Path 2

2.5C11 Measure with graduated devices

12.4A Precision electrical/electronic measurement

Element 12.5B.1 Check equipment for correct operation

Criteria 12.5B.1.1

Appropriate checks made of components, leads, fasteners, etc. for wear, loose connections or other faults.

Assessor guide: observe that –

The measuring equipment is checked for faults using appropriate tools and equipment in accordance with standard operating procedures.

Assessor guide: confirm that –

The correct operation of the measuring equipment can be identified. All wearing parts, connections and components of the measuring equipment can be identified. The checks that are to be made of wearing parts, connections and components can be identified. The procedures for checking the equipment for correct operation can be given. Where appropriate, the fault(s) in the measuring equipment can be identified. Where appropriate, the effects of the detected faults on the performance/accuracy of the measuring equipment can be explained. The tools and equipment to be used when checking the measuring equipment can be identified.

Element 12.5B.2 Validate/calibrate precision measuring equipment**Criteria 12.5B.2.1**

Assess calibration of precision measuring equipment to manufacturer's specifications and/or standard operating procedures.

Assessor guide: observe that –

The calibration of the measuring equipment is checked for conformance to specifications using appropriate techniques in accordance with standard operating procedures and all relevant codes, standards and legislative/regulatory requirements.

Assessor guide: confirm that –

The specifications of the measuring equipment can be identified. The tools and equipment required to check the calibration of the measuring equipment can be identified. The procedures for checking the calibration of the measuring equipment can be given. Any codes, standards, legislative or regulatory requirements applicable to the measuring equipment and/or its calibration can be identified.

Criteria 12.5B.2.2

Equipment is calibrated against appropriate physical standards using correct calibration devices, equipment, techniques and procedures.

Assessor guide: observe that –

The measuring equipment is calibrated against the appropriate physical standard in accordance with standard operating procedures and all relevant codes, standards and legislative/regulatory requirements.

Assessor guide: confirm that –

The appropriate physical standard against which the measuring equipment is to be calibrated can be identified. The procedures for calibrating the measuring equipment can be given. The tools and equipment required to calibrate the measuring equipment can be identified.

Criteria 12.5B.2.3

Equipment is recommissioned in accordance with standard operating procedure.

Assessor guide: observe that –

The measuring equipment is recommissioned in accordance with standard operating procedures and all relevant codes, standards and legislative/regulatory requirements.

Assessor guide: confirm that –

The procedure for commissioning the measuring equipment can be identified. The calibration records to be kept/ maintained can be identified.

Range statement

This unit applies to the calibration skills used in the setting, adjustment, validation or verification of precision mechanical and/or electrical, electronic measuring instruments using reference standards in accordance with predetermined procedures. Recommissioning may include sealing, tagging, identification or storage in accordance with standard operating procedure. This unit is not meant to apply to simple zeroing, external adjustment or manual adjustment for size range e.g. micrometers etc., these skills are covered by Unit 2.5C11 (Measure with graduated devices), Unit 12.3A (Precision mechanical measurement) or Unit 12.4A (Precision electrical/electronic measurement) as appropriate. Procedures may involve use of electronic setting equipment and the selection or determination of an appropriate external standard calibration involves the use of techniques, tools and equipment to meet manufacturer's specifications and/or national standards or equivalent.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the calibration of measuring equipment or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 12.6A A Mark off/out (general engineering)

Band – Specialisation band A

Field – Measurement

Unit Weight 4

Pre-requisite units - Path 1

9.2A Interpret technical drawing

Element 12.6A.1 Determine job requirements

Criteria 12.6A.1.1

Drawings, job instructions and specifications are interpreted and understood.

Assessor guide: observe that –

All relevant job instructions, drawings, specifications and procedures are obtained in accordance with workplace procedures.

Assessor guide: confirm that –

The work to be marked off/out can be identified. The specifications of the work can be identified. The proposed manufacturing process can be identified.

Criteria 12.6A.1.2

Appropriate methods and sequencing selected consistent with proposed manufacturing process using standard operating procedures.

Assessor guide: observe that –

Assessor guide: confirm that –

The procedures for marking off/out work can be given. The appropriate method and sequence of marking out can be identified. The tools, equipment and techniques required to mark out the work can be identified. The reasons for selecting the chosen marking off/out method and sequence can be explained.

Element 12.6A.2 Transfer dimension

Criteria 12.6A.2.1

Using appropriate tools and equipment all marking off/out carried out to specifications.

Assessor guide: observe that –

All marking off/out is carried out to specification using appropriate tools, techniques and equipment in accordance with standard operating procedures.

Assessor guide: confirm that –

Criteria 12.6A.2.2

Datum points correctly established.

Assessor guide: observe that –

The datum points are established correctly in accordance with standard operating procedures.

Assessor guide: confirm that –

The purpose of establishing datum points when marking off/out work can be explained.

Criteria 12.6A.2.3

Dimensions transferred and correct and appropriate calculations are used where required.

Assessor guide: observe that –

The dimensions transferred to the work are correct and in accordance with specifications. Where appropriate, additional dimensions required for marking off/out purposes are correctly calculated.

Assessor guide: confirm that –

The method of determining/ calculating dimensions required for marking out purposes can be given.

Element 12.6A.3 Make templates as required**Criteria 12.6A.3.1**

Appropriate template material selected.

Assessor guide: observe that –

The appropriate template material is selected.

Assessor guide: confirm that –

Materials suitable for the manufacture of templates and their application can be given. The most appropriate template material is selected for given work requirements. The reasons for selecting the chosen template material can be given.

Criteria 12.6A.3.2

Templates produced to specifications and appropriate to desired use.

Assessor guide: observe that –

Templates are produced to specification in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for producing templates appropriate to their application can be given.

Criteria 12.6A.3.3

Correct storage procedures followed including labelling and identification to standard operating procedures.

Assessor guide: observe that –

Templates are stored and handled correctly in accordance with standard operating procedures. Templates are appropriately labelled and marked for identification in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for storing and handling templates can be given. The labelling and identification to be placed on templates can be identified. The consequences of inappropriate handling and storing of templates can be explained.

Range statement

This unit applies to the marking off/out techniques used for the transfer of dimensions from engineering drawings, prints or plans. This unit covers marking out on engineering components, jigs and fixtures, castings, templates, dies and tooling etc. Work is undertaken autonomously using predetermined standards of quality, safety and workshop procedures. The task may be performed in the workshop or in situ. Marking off/out is undertaken using appropriate tools and equipment; templates are produced as required. Equipment may include marking out tables, surface tables, rotary tables, dividing heads etc., vee blocks, cylinder squares, sine bars and the like, vernier height gauges, protractors, straight edge and set squares etc. Marking off/out techniques may apply to a range of materials and shapes. This unit is not intended to cover the skills used in a simple transfer of a dimension or marking a location point associated with general engineering and maintenance functions. For these skills see Unit 7.5A (Perform general machining), Unit 18.6A (Dismantle/repair/replace/assemble and fit engineering components) or Unit 18.14A (Tool, gauge and die manufacture). Where a higher level of calculation, measurement or precision work is required see Unit 2.13C5 (Perform mathematical computations), Unit 12.3A (Precision mechanical measurement) or Unit 18.3A (Use tools for precision work) respectively. For marking out structural fabrications and shapes refer Unit 12.7A (Mark off/out structural fabrications and shapes).

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the marking off/out of components or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 12.7A B Mark off/out structural fabrications and shapes

Band – Specialisation band A

Field – Measurement

Unit Weight 4

This unit covers the competencies required to transfer the dimensions from the detail drawing to work, make templates as required, develop patterns and or transfer measurements to structures, interpret relevant codes, standards and symbols and estimate quantities of material from drawings. The unit applies to the marking off/out of general fabrications and shapes using appropriate tools and equipment.

Element 12.7A.1 Transfer dimensions from a detail drawing to work or surface

Criteria 12.7A.1.1

Specifications and work requirements determined and understood using correct and appropriate calculations

Assessor guide: observe that –

Job instructions and specifications are obtained in accordance with work site procedures All necessary calculations are performed correctly and accurately

Assessor guide: confirm that –

The work to be undertaken can be identified The specifications applicable to the work to be done can be identified

Criteria 12.7A.1.2

Marking out carried out to specifications or standard operating procedures using appropriate tools and equipment

Assessor guide: observe that –

The marking off/out is carried out accurately using appropriate techniques, procedures and equipment Marking off/out is checked against specifications

Assessor guide: confirm that –

The tools and equipment to be used in the preparation of the marking off/out can be identified

Criteria 12.7A.1.3

Datum points correctly established

Assessor guide: observe that –

All datum points are correctly established and appropriately marked

Assessor guide: confirm that –

The datum points can be identified

Element 12.7A.2 Make templates/patterns as required

Criteria 12.7A.2.1

Appropriate template/pattern material chosen

Assessor guide: observe that –

Assessor guide: confirm that –

Materials that can be used for the preparation of templates and their application can be given The appropriate template material for the given application can be

Criteria 12.7A.2.2

Templates produced to specifications

Assessor guide: observe that –

The template is produced to specification in accordance with standard operating procedures All manufacturing allowances are correctly and accurately calculated

Assessor guide: confirm that –

The manufacturing allowances that have to be considered when developing patterns can be identified

Criteria 12.7A.2.3

Correct storage procedures followed including labelling and identification to standard operating procedures

Assessor guide: observe that –

Templates are labelled and stored in accordance with standard operating procedures

Assessor guide: confirm that –

Template labelling and identification procedures can be identified The appropriate storage requirements of templates can be identified

Element 12.7A.3 Develop patterns and/or transfer measurements to structures**Criteria 12.7A.3.1**

Most appropriate development and/or measurement sequence chosen and applied

Assessor guide: observe that –

Patterns are developed/lay out equipment assembled and structures are marked off/out using the appropriate method(s) in accordance with standard operating procedures

Assessor guide: confirm that –

The three development methods and their application can be identified The appropriate method(s) of development/marking off/out of a range of given objects can be identified

Criteria 12.7A.3.2

Allowances for fabrication and assembly correctly determined and transferred

Assessor guide: observe that –

Fabrication and assembly allowances are correctly determined and transferred to the pattern

Assessor guide: confirm that –

The appropriate fabrication and assembly allowances can be identified The effects of material type and thickness on fabrication and assembly allowances can be identified The sources of data on fabrication and assembly allowances can be identified

Criteria 12.7A.3.3

Measurement transfer/layout of components is checked to ensure accuracy/set out

Assessor guide: observe that –

Assessor guide: confirm that –

Element 12.7A.4 Interpret relevant codes, standards and symbols**Criteria 12.7A.4.1**

Relevant standards/codes and symbols interpreted meaning of symbols used in the standards/codes can be given

Assessor guide: observe that –

Assessor guide: confirm that –

All relevant standards and codes can be identified The

Criteria 12.7A.4.2

Requirements of standards/codes interpreted and applied to materials and processes

Assessor guide: observe that –

Where applicable, the requirements of the codes/standards are correctly applied during the geometric development/marketing off/out process

Assessor guide: confirm that –

The requirements of the codes/ standards applicable to the work to be done can be identified

Element 12.7A.5 Estimate quantities of materials from detail drawings**Criteria 12.7A.5.1**

Materials correctly identified

Assessor guide: observe that –

Assessor guide: confirm that –

The material(s) from which the component/assembly is to be manufactured can be identified

Criteria 12.7A.5.2

Quantities estimated from drawing

Assessor guide: observe that –

Material and component quantities are correctly determined from drawings and job specifications

Assessor guide: confirm that –

Criteria 12.7A.5.3

Material wastage minimised

Assessor guide: observe that –

Material wastage is minimised during the development of patterns/ templates and the marking off/out of structures

Assessor guide: confirm that –

The benefits of minimising material wastage can be given

Range statement

This unit applies to marking out of general fabrications and shapes. In a marine setting, it includes basic lofting/set out for construction of marine vessels and may include items such as stem and transom development and use of tables of offsets that reflect chine and hull configuration. Where more extensive lofting practices are used, Unit 9.21A (Interpret and produce curved 3 dimensional shapes) should be considered. Work is undertaken autonomously using predetermined standards of quality, safety and workshop procedures. All work and work practices carried out to industry, regulatory and legislative requirements. The task may be performed in the workshop or in-situ. Marking out is undertaken using appropriate tools and equipment. Templates and patterns are produced as required. Equipment may include marking out and surface tables, dividers, protractors, squares etc. In a marine setting this may include lofting surfaces, straightedges, stringlines, french curves, templates, etc. Marking out techniques may apply to a range of materials and shapes. For marking out general engineering components refer to Unit 12.6A (Mark off/out (general engineering)).

Evidence guide**Assessment context**

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the marking off/out of structural fabrications and shapes or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

activities

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace

Range statement

This unit applies to marking out of general fabrications and shapes. Work is undertaken autonomously using predetermined standards of quality, safety and workshop procedures. The task may be performed in the workshop or in situ. Marking out is undertaken using appropriate tools and equipment. Templates and patterns are produced as required. Equipment may include marking out and surface tables, dividers, protractors, squares, etc. Marking out techniques may apply to a range of materials and shapes. For marking out general engineering components refer to Unit 12.6A (Mark off/out (general engineering)).

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the marking off/out of structural fabrications and shapes or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 12.19A A Measure components using coordinate measuring machine

Band – Specialisation band A

Field – Measurement

Unit Weight 4

Element 12.19A.1 Identify job requirements

Criteria 12.19A.1.1

Job sheets or equivalent instructions interpreted correctly.

Assessor guide: observe that –

All information for loading, setting probes and measuring components is interpreted.

Assessor guide: confirm that –

The operator can identify and explain all the required information on job sheets or equivalent.

Element 12.19A.2 Load components

Criteria 12.19A.2.1

Pre-start checks undertaken to standard operating procedures.

Assessor guide: observe that –

Pre-start check procedure is correctly identified.

Assessor guide: confirm that –

The pre-start checks to be undertaken can be identified and each step/check can be explained.

Criteria 12.19A.2.2

Correct safety procedures are observed and all safety equipment checked for correct operation.

Assessor guide: observe that –

Operator follows safety procedures at all times.

Assessor guide: confirm that –

All safety issues pertaining to the equipment setup can be outlined.

Criteria 12.19A.2.3

Correct fixture/clamping device selected.

Assessor guide: observe that –

The correct fixture/clamping device is selected in accordance with the standard operating procedure.

Assessor guide: confirm that –

The procedure for selecting fixture/clamping device can be explained. Different fixtures/clamping devices and their uses can be explained. Storage location and condition can be outlined.

Criteria 12.19A.2.4

Component and fixtures loaded and clamped in accordance with standard operating procedures.

Assessor guide: observe that –

Component is correctly positioned and clamped using suitable techniques/accessories.

Assessor guide: confirm that –

Different fixing/clamping methods can be outlined.

Element 12.19A.3 Set probes**Criteria 12.19A.3.1**

Pre-measurement manual hits are taken for manual alignment in accordance with standard operating procedures.

Assessor guide: observe that –

The correct number/position of hits is taken and alignment determined.

Assessor guide: confirm that –

The procedure for undertaking pre-measurement manual hits for manual alignment is identified. The reason for taking pre-measurement manual hits can be explained.

Criteria 12.19A.3.2

Probe configuration is checked for compliance to specification.

Assessor guide: observe that –

The probe/s configuration is verified as correct according to specifications.

Assessor guide: confirm that –

The procedure for checking probe configuration can be explained.

Element 12.19A.4 Measure components**Criteria 12.19A.4.1**

Part program selected, run and verified according to standard operating procedure.

Assessor guide: observe that –

Correct part program is selected. Part program is activated correctly. Program is verified and correct operation confirmed.

Assessor guide: confirm that –

The procedure for running and verifying part program is identified. The reasons for verifying part program can be explained.

Criteria 12.19A.4.2

Components are measured according to standard operating procedure.

Assessor guide: observe that –

The correct measuring techniques are used.

Assessor guide: confirm that –

The reason for location and number of measurements taken can be explained.

Criteria 12.19A.4.3

Results interpreted and non-conforming/out of tolerance measurements identified and reported.

Assessor guide: observe that –

Results are correctly interpreted and explained. Out of tolerance measurements reported correctly. Required changes to process machine identified.

Assessor guide: confirm that –

Methods/techniques for interpreting results can be outlined. The meaning of different results can be explained. Reporting procedures and recommendations for adjustment can be explained.

Criteria 12.19A.4.4

Part program correct shut down and components removed according to standard operating procedure.

Assessor guide: observe that –

Operator demonstrates how to shut down the part program. Operator removes components safely and without damage.

Assessor guide: confirm that –

Key aspects of shutting down part program can be explained. The main steps to removing a component safely can be explained.

Criteria 12.19A.4.5

Coordinate measuring machine, accessories and surrounds left in a clean, safe condition.

Assessor guide: observe that –

Operator cleans machine and site correctly. Operator leaves machine in a safe condition.

Assessor guide: confirm that –

All required cleaning tasks can be outlined and the importance of cleaning the CMM outlined. Effects of excess contamination can be explained. Requirements for leaving CMM in safe condition can be outlined.

Range statement

The skills described in this unit apply to a range of Co-ordinate Measuring Machines (CMM) used mainly in a production environment. The operator is responsible for determining requirement for adjustment of the manufacturing process after measurement of components with the CMM. Work is performed to established processes, practices, standard operating procedures and specifications. Work is carried out autonomously using pre-determined standards of quality and safety. Operators would be expected to have competence in basic setting and adjusting machines. An appropriate level of measurement skill should be selected with this unit. Where it is required to use tools then unit 18.1A (Use hand tools) should also be selected. Where basic operation excludes setting up components and manually aligning probes, Unit 7.24A (Operate and monitor machine/process) should be selected. Where other machines/processes are to be adjusted as a consequence of the CMM operation, appropriate machining/process operation units should also be selected.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with basic operation of a coordinate measuring machine and/or processes or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 12.20A A Set and operate coordinate measuring machine

Band – Specialisation band A

Field – Measurement

Unit Weight 2

Element 12.20A.1 Determine job requirements

Criteria 12.20A.1.1

Instructions/plans and relevant job specifications understood and correctly followed.

Assessor guide: observe that –

All necessary information is interpreted from job sheets, instructions.

Assessor guide: confirm that –

The operator can identify and explain all of the required information on job sheets/instruction.

Criteria 12.20A.1.2

Drawing information interpreted correctly and the range of tolerances applying to components is understood.

Assessor guide: observe that –

The required information is identified from the drawing and the tolerance range applying to the component is identified.

Assessor guide: confirm that –

Typical information and tolerances can be identified and explained.

Element 12.20A.2 Set up/orient components

Criteria 12.20A.2.1

Pre-start checks undertaken to standard operating procedures.

Assessor guide: observe that –

Pre-start check procedure is correctly identified.

Assessor guide: confirm that –

The pre-start checks to be undertaken can be identified and each step can be explained.

Criteria 12.20A.2.2

Correct safety procedures are observed and all equipment checked for safe operation.

Assessor guide: observe that –

Operator follows safe procedures at all times.

Assessor guide: confirm that –

Safety issues pertaining to the equipment and setup can be explained.

Criteria 12.20A.2.3

The most appropriate method of clamping is determined to minimise clamping and maximise measuring access.

Assessor guide: observe that –

The correct fixture/clamping device/method is selected from a range of fixtures/devices/methods. The location of the clamping device allows maximum access for measurement.

Assessor guide: confirm that –

The procedure for selecting the appropriate fixture/clamping device/method can be explained. The principles and functions of various fixtures/clamping devices/methods is explained. The setting up/orientation procedure selected is the most efficient, safe and accurate method. Storage location and condition can be outlined.

Criteria 12.20A.2.4

Component/fixture/clamping devices correctly set up and oriented.

Assessor guide: observe that –

The component to be measured is correctly and accurately positioned and secured.

Assessor guide: confirm that –

The reasons for the location of the component and fixtures/clamping devices can be explained. The reasons for each step in the setup procedure can be explained. Alternative methods of fixing/clamping can be outlined.

Element 12.20A.3 Select and activate part programs**Criteria 12.20A.3.1**

Part program is identified according to standard operating procedure.

Assessor guide: observe that –

Correct part program is selected by number or name.

Assessor guide: confirm that –

The procedure for determining the correct part program from list is identified according to standard operating procedures.

Criteria 12.20A.3.2

Part program is verified.

Assessor guide: observe that –

The program selected reflects any upgrades in the drawing/plan.

Assessor guide: confirm that –

The procedure for verifying changes/upgrades to part programs can be explained.

Criteria 12.20A.3.3

Selected part program is activated according to standard operating procedure.

Assessor guide: observe that –

Part program is activated correctly.

Assessor guide: confirm that –

The procedure for activating the selected part program can be explained.

Element 12.20A.4 Prepare CMM**Criteria 12.20A.4.1**

Determine probe configuration according to specifications.

Assessor guide: observe that –

The probe configuration is correctly determined according to specifications.

Assessor guide: confirm that –

Different probe configurations can be identified and explained. Various probes and their uses can be explained.

Criteria 12.20A.4.2

Probe configuration is adjusted on CMM according to standard operating procedures.

Assessor guide: observe that –

The method for adjusting probes is correctly demonstrated.

Assessor guide: confirm that –

The procedure for adjusting probes configuration can be explained.

Criteria 12.20A.4.3

Probe angles checked for compliance and adjusted as required.

Assessor guide: observe that –

Probe angles are checked for compliance and adjusted as required.

Assessor guide: confirm that –

The reasons for setting probe angles can be explained. The procedure for checking probe angles can be outlined.

Criteria 12.20A.4.4

Re-set/re-calibrate CMM.

Assessor guide: observe that –

The CMM is correctly re-set/re-calibrated to specifications.

Assessor guide: confirm that –

The procedure for re-setting/re-calibration can be outlined. The reasons for re-setting/re-calibration can be explained. The precautions to be taken to reduce the need for re-setting/re-calibration can be outlined.

Criteria 12.20A.4.5

Manually align probes for one off components.

Assessor guide: observe that –

The correct number and positions of manual hits is taken.

Assessor guide: confirm that –

The procedure for undertaking pre-measurement manual hits for manual alignment is identified. The reasons for taking pre-measurement manual hits can be explained.

Element 12.20A.5 Edit part programs**Criteria 12.20A.5.1**

Part program edited to compensate for errors or changes to component specifications.

Assessor guide: observe that –

Problems/errors in program identified. Program correctly edited to ensure accurate operation.

Assessor guide: confirm that –

The procedure used for editing can be outlined. The reasons for editing can be explained.

Element 12.20A.6 Measure components**Criteria 12.20A.6.1**

Components measured and checked for conformance to specification.

Assessor guide: observe that –

Results are checked against drawings/ specifications and non conformance identified.

Assessor guide: confirm that –

Procedure for interpretation of results can be outlined.

Criteria 12.20A.6.2

Produce data/report.

Assessor guide: observe that –

The component report is printed/stored in computer as required. Report forwarded to the appropriate personnel.

Assessor guide: confirm that –

The procedure for maintaining records is explained. The details required by various personnel and the procedure for forwarding reports is explained.

Range statement

The skills described in this unit apply to a range of Co-ordinate Measuring Machines (CMM). Work is performed to established processes, practices, standard operating procedures and specifications. Work is carried out autonomously using pre-determined standards of quality and safety. The procedures apply to both one off and multiple components. Appropriate levels of measurement, computer operations and drawing skills should be selected with this unit. Where a range of hand tools is required Unit 18.1A (Use hand tools) should also be selected.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with operating and setting coordinate measuring machines and/or processes or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 12.21A A Program coordinate measuring machine

Band – Specialisation band A

Field – Measurement

Unit Weight 4

Pre-requisite units - Path 1

9.1A Draw and interpret sketch

9.2A Interpret technical drawing

12.3A Precision mechanical measurement

Element 12.21A.1 Identify part program parameters

Criteria 12.21A.1.1

Job specifications and requirements correctly established.

Assessor guide: observe that –

All specifications/drawings/instructions are correctly interpreted and the parameters of the part program understood.

Assessor guide: confirm that –

The procedure for producing the part program can be explained. The specifications for the program can be outlined.

Criteria 12.21A.1.2

Appropriate units are selected to comply with specifications.

Assessor guide: observe that –

The correct units for the part program are selected according to standard operating procedures.

Assessor guide: confirm that –

The criteria for selecting specific units can be identified.

Criteria 12.21A.1.3

Part program name is specified according to standard operating procedures.

Assessor guide: observe that –

The part program name complies with current identification/quality system.

Assessor guide: confirm that –

The procedures and parameters for naming programs can be outlined.

Element 12.21A.2 Establish single probe configurations

Criteria 12.21A.2.1

Single probe configuration is determined according to standard operating procedures.

Assessor guide: observe that –

The probe configuration is correctly determined.

Assessor guide: confirm that –

The procedure for determining probe configuration can be outlined. The reasons for selecting single probe configuration can be explained.

Criteria 12.21A.2.2

Probe angles are determined and qualified in accordance with standard operating procedure.

Assessor guide: observe that –

Probe angles are correctly calculated/determined and qualified.

Assessor guide: confirm that –

The procedure for determining/calculating probe angles can be explained. The correct procedure and parameters for qualification can be outlined.

Element 12.21A.3 Position/align component**Criteria 12.21A.3.1**

Component/part positioned and oriented correctly.

Assessor guide: observe that –

The component/part is positioned/aligned/secured to appropriate orientation on CMM table and complies with probe configuration and calibrated angles.

Assessor guide: confirm that –

The reasons for the specific location and aligning/securing the component/part can be explained. The method of securing/clamping can be justified.

Criteria 12.21A.3.2

Manual alignment created according to standard operating procedure.

Assessor guide: observe that –

An appropriate number of hits taken to create an accurate manual alignment.

Assessor guide: confirm that –

The methodology used to create manual alignment for the part can be explained.

Criteria 12.21A.3.3

Single Direct Computer Control (DCC) alignment is created according to standard operating procedure.

Assessor guide: observe that –

The correct procedure for creating DCC alignment is demonstrated.

Assessor guide: confirm that –

The procedure and reasons for creating a single DCC alignment can be explained.

Element 12.21A.4 Measure features**Criteria 12.21A.4.1**

Features are measured correctly.

Assessor guide: observe that –

The part features are measured in the correct sequence and location in a single work plane.

Assessor guide: confirm that –

The correct procedure for measuring component/part features in a single plane can be explained.

Criteria 12.21A.4.2

Probe movement parameters are defined in accordance with standard operating procedures.

Assessor guide: observe that –

The parameters are correctly defined and verified.

Assessor guide: confirm that –

The criteria for defining probe movement can be outlined. The procedure for verifying correct probe movement can be outlined.

Criteria 12.21A.4.3 Basic features dimensioned according to specifications.	<i>Assessor guide: observe that –</i> Basic feature such as circles, points etc are correctly dimensioned.	<i>Assessor guide: confirm that –</i> Dimensioning techniques can be explained Standard dimensioning techniques are followed.
Criteria 12.21A.4.4 Operator notes reported.	<i>Assessor guide: observe that –</i> Explanatory notes for the operator are produced and inserted.	<i>Assessor guide: confirm that –</i> The operator notes are logical, clear and relevant. The reasons for explanatory operator notes can be outlined.
Criteria 12.21A.4.5 Dimension descriptions are inserted.	<i>Assessor guide: observe that –</i> All necessary dimension descriptions are inserted in accordance with standard operating procedures.	<i>Assessor guide: confirm that –</i> Dimension descriptions are adequate for the task. The procedure and parameters can be outlined. References are made to relevant standards.
Element 12.21A.5 Verify and backup the program		
Criteria 12.21A.5.1 Execution and accuracy of program verified according to standard operating procedure.	<i>Assessor guide: observe that –</i> The part program is run and the accuracy of the results verified.	<i>Assessor guide: confirm that –</i> The procedure for running the program can be outlined. The program runs without fault and within the parameters required. The procedure for verifying the results can be explained.
Criteria 12.21A.5.2 Edit program if required.	<i>Assessor guide: observe that –</i> Where non-conformance is identified from verification procedure, appropriate editing is undertaken.	<i>Assessor guide: confirm that –</i> Editing process and reasons can be explained. Final program is free from errors.
Criteria 12.21A.5.3 Results output to various formats according to standard operating procedure.	<i>Assessor guide: observe that –</i> Results output to printer, disc or other format as required.	<i>Assessor guide: confirm that –</i> The procedures used to output results to various formats can be explained.

Criteria 12.21A.5.4

Archive and backup program.

Assessor guide: observe that –

Part program correctly archived and backup copies produced according to standard operating procedures.

Assessor guide: confirm that –

The method used to archive the program is outlined. The procedure used to backup is outlined. Access limitations by personnel and quality control guidelines can be explained.

Range statement

The skills in this unit extend to writing basic programs to measure features of a part in a single work plane using a single probe. The program produced may be used on a range of Coordinate Measuring Machines and would be suitably archived and backed up. Programs are trialed and edited as necessary. Work would be undertaken autonomously using predetermined standards of quality. For programming using multiple probes and more than one plane Unit 12.22A (Program coordinate measuring machine (advanced)) should be selected. Appropriate levels of measuring, computer and engineering drawing skills should be selected with this unit.

Evidence guide**Assessment context**

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with basic programming of coordinate measuring machines and/or processes or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 12.22A A Program coordinate measuring machine (advanced)

Band – Specialisation band A

Field – Measurement

Unit Weight 2

Pre-requisite units - Path 1

9.1A Draw and interpret sketch

9.2A Interpret technical drawing

12.3A Precision mechanical measurement

Element 12.22A.1 Determine program requirements

Criteria 12.22A.1.1

Part parameters and measurement requirements determined.

Assessor guide: observe that –

Job sheets, drawings and/or instructions correctly interpreted, job requirements established and the required parameters of the program are understood.

Assessor guide: confirm that –

The program specifications can be outlined. The procedure for producing the program can be explained.

Criteria 12.22A.1.2

Program attributes are determined and established according to standard operating procedures.

Assessor guide: observe that –

The part program name complies with current identification system. The correct units are selected.

Assessor guide: confirm that –

The parameters for selecting attributes can be outlined.

Element 12.22A.2 Determine probe configuration for multiple probes

Criteria 12.22A.2.1

Probe configuration determined according to standard operating procedure.

Assessor guide: observe that –

Suitable probes are selected and probe configuration is correctly determined.

Assessor guide: confirm that –

The reason for selecting multiple probes can be explained. The procedure for determining multiple probe configuration can be outlined.

Criteria 12.22A.2.2

Determine probe angles and qualify multiple probes.

Assessor guide: observe that –

The probe angles for each probe are correctly determined and qualified.

Assessor guide: confirm that –

The procedure for determining probe angles can be explained. The qualification procedure can be outlined.

Element 12.22A.3 Create multiple Direct Computer Control (DCC) alignment**Criteria 12.22A.3.1**

Multiple DCC alignment is created according to standard operating procedure.

Assessor guide: observe that –

Multiple DCC alignment is correctly created.

Assessor guide: confirm that –

The procedure for creating DCC alignment can be outlined. The critical differences between single and multiple DCC alignment can be explained.

Criteria 12.22A.3.2

DCC sub-routines are integrated.

Assessor guide: observe that –

New and/or existing DCC sub-routines are integrated into the program.

Assessor guide: confirm that –

Problems due to integrating sub-routines can be explained. Advantages to be gained through integration of DCC sub-routines can be outlined.

Element 12.22A.4 Construct advanced geometric features**Criteria 12.22A.4.1**

Geometric features determined and constructed.

Assessor guide: observe that –

The geometric features for the program are correctly constructed in a logical sequence.

Assessor guide: confirm that –

The procedure for constructing geometric features can be explained. The reasons for constructing features in the sequence followed can be explained.

Criteria 12.22A.4.2

Features dimensioned according to standard operating procedures.

Assessor guide: observe that –

All necessary dimensions/notes/instructions are included in the program.

Assessor guide: confirm that –

The dimensioning techniques comply with relevant standards. All notes/instructions are clear and logical.

Element 12.22A.5 Review and maintain part programs/system**Criteria 12.22A.5.1**

Part programs are reviewed/edited to comply with changes to specifications.

Assessor guide: observe that –

The program is reviewed against specifications and correctly edited.

Assessor guide: confirm that –

The procedures and parameters for editing, archiving and backing up programs can be explained. The effects of editing particular sections of the program can be outlined.

Criteria 12.22A.5.2

System wide options are changed.

Assessor guide: observe that –

System wide operations are changed to ensure the most efficient operation of the program. Appropriate checks are made to ensure the integrity of the system is maintained.

Assessor guide: confirm that –

The effects on other programs of changing software or hardware options can be explained. The procedures for changing system-wide options can be outlined.

Criteria 12.22A.5.3

Programs are archived and backed up according to standard operating procedures.

Assessor guide: observe that –

Archive and backing up procedures are correctly followed.

Assessor guide: confirm that –

Archive and backup procedures can be given. The procedures for archiving can be explained. Backup options can be outlined. The list of recipients or those with access rights to the programs can be outlined.

Criteria 12.22A.5.4

Results output to various formats according to standard operating procedure.

Assessor guide: observe that –

Results output to printer, disc or other format as required
Appropriate personnel notified.

Assessor guide: confirm that –

The procedures for producing/storing results/reports can be explained. The list of recipients or those with access to the programs can be outlined. The procedure for notifying personnel of completion of the program is explained.

Range statement

The skills in this unit extend to writing programs to measure features of parts in multiple planes using multiple probes. The program produced may be used on a range of Coordinate Measuring Machines and would be suitably archived and backed up. Programs are trialed and edited as necessary. Work would be undertaken autonomously using predetermined standards of quality. For programming using single probes in a single plane Unit 12.21A (Program coordinate measuring machine) should be selected.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with programming of coordinate measuring machines and/or processes or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 13.1A A Perform emergency first aid

Band – Specialisation band A

Field – Occupational health & safety

Unit Weight 1

Notes - Competencies for recognised first aid qualifications are determined by such bodies as St Johns Ambulance etc. and are not covered within these standards.

Element 13.1A.1 Perform emergency first aid

Criteria 13.1A.1.1

Correct procedures for CPR (cardio pulmonary resuscitation) demonstrated on a mannequin.

Assessor guide: observe that –

The correct procedures for CPR are demonstrated on a mannequin.

Assessor guide: confirm that –

The instances where CPR should be applied can be given. The procedures for preparing a person for the administration of CPR can be identified. The procedures to be followed when performing CPR on a child and an adult can be given. The dangers and precautions to be taken when administering CPR can be explained.

Criteria 13.1A.1.2

First aid treatment of injuries carried out.

Assessor guide: observe that –

The appropriate first aid treatment for the full range of injuries can be demonstrated during simulated exercises.

Assessor guide: confirm that –

The first aid procedures to be applied in situations where the following injuries have occurred can be identified: - burns/scalds - fractures - cuts and abrasions - poisoning - foreign bodies in eyes - concussion - shock.

Criteria 13.1A.1.3

Details of first aid given recorded.

Assessor guide: observe that –

Assessor guide: confirm that –

The details to be recorded of first aid given can be identified. The procedures for recording first aid given can be identified. The reasons for recording first aid given can be explained.

Criteria 13.1A.1.4

Understanding of relevant regulatory and legislative requirements demonstrated.

Assessor guide: observe that –

Assessor guide: confirm that –

The relevant regulatory and legislative requirements with respect to emergency first aid can be identified. The impact of those regulatory/ legislative requirements on the individual and others can be explained.

Range statement

This unit covers basic first aid and the management of life threatening situations where an unconscious person requires breathing and cardiac emergency resuscitation (EAR and CPR). The competencies required for situations involving isolation of persons from hazardous electrical situations are covered in Unit 18.49A (Disconnect/reconnect fixed wired equipment up to 1000 volts AC and 1500 volts DC) and Unit 10.3A (Install and test electrical wiring and circuits (up to 1000 volts AC and 1500 volts DC)). This unit does not meet all of the requirements expected of designated First Aid Officers.

Evidence guide**Assessment context**

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the performance of first aid or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 13.2A A Undertake occupational health and safety activities in the workplace

Band – Specialisation band A

Field – Occupational health & safety

Unit Weight 3

This unit covers the competencies required to apply the principles of OHS in the workplace and undertake a safety audit for the employee's area of responsibility. It applies to those who need OHS competencies beyond those inherent in their jobs.

Element 13.2A.1 Apply principles of OHS in a workplace

Criteria 13.2A.1.1

Understanding of basic OHS principles of hazard identification, assessment and control demonstrated

Assessor guide: observe that –

Assessor guide: confirm that –

The principles of hazard identification, assessment and control as applied to the workplace can be given The procedures for hazard identification, assessment and control can be given

Criteria 13.2A.1.2

Understanding of OHS legislation as it is applied in the workplace is demonstrated

Assessor guide: observe that –

Assessor guide: confirm that –

The application of the OHS legislation in the workplace can be explained

Element 13.2A.2 Carry out safety audit

Criteria 13.2A.2.1

Regular safety audit in the area of responsibility is carried out in accordance with appropriate standards

Assessor guide: observe that –

Regular safety audits of the individual's area(s) of responsibility are carried out in accordance with the relevant standards and standard operating procedures

Assessor guide: confirm that –

The procedures for conducting safety audits can be given The safety standards applicable to the individual's area(s) of responsibility can be identified The frequency at which safety audits should be conducted can be identified

Element 13.2A.3 Identify health and safety improvements

Criteria 13.2A.3.1

On the basis of safety audit or as required, formulate recommendations and identify hazards to be rectified

Assessor guide: observe that –

Assessor guide: confirm that –

The procedures for implementing OHS improvements can be given The means of rectifying given or identified hazards can be stated The reasons for selecting the chosen means of rectifying the hazard can be given The authority to whom recommended OHS improvements are to be reported can be identified

Criteria 13.2A.3.2

Make safety improvements using standard operating procedures

Assessor guide: observe that –

Where appropriate, safety improvements are made in accordance with standard operating procedures

Assessor guide: confirm that –

The procedures for making safety improvements can be given

Criteria 13.2A.3.3

OHS training needs identified

Assessor guide: observe that –

Where appropriate, OHS training is initiated in accordance with standard operating procedures

Assessor guide: confirm that –

The requirement for OHS training in the individual's area(s) of responsibility can be identified The objectives of the training can be identified The procedures for initiating OHS training can be given

Element 13.2A.4 Follow requirements of enterprise OHS program including emergency procedures**Criteria 13.2A.4.1**

Ensure that requirements of OHS program satisfied in the area of responsibility, for example, accident investigation, emergency procedures

Assessor guide: observe that –

The requirements of the OHS program and procedures in the individual's area(s) of responsibility are being met

Assessor guide: confirm that –

The procedures for accident investigation can be given The emergency procedures can be given The role of the individual in carrying out accident investigations and emergency procedures can be explained

Range statement

This unit is intended to apply to employees requiring additional Occupational Health and Safety (OHS) competencies beyond those inherent in their job.

Evidence**Assessment context**

This unit should be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the undertaking of occupational health and safety activities in the workplace or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 13.3A A Work safely with industrial chemicals and materials

Band – Specialisation band A

Field – Occupational health & safety

Unit Weight 2

Element 13.3A.1 Use personal protection equipment

Criteria 13.3A.1.1

Correct and appropriate safety clothing and personal safety equipment is selected and used correctly.

Assessor guide: observe that –

Appropriate safety clothing and personal safety equipment is used correctly in accordance with work site procedures.

Assessor guide: confirm that –

The hazards associated with the industrial chemicals/materials being used can be identified. The appropriate safety clothing and personal safety equipment required to safely handle the industrial chemicals/materials being used can be identified.

Element 13.3A.2 Identify emergency procedures

Criteria 13.3A.2.1

Emergency procedures are understood and demonstrated as laid down in approved safety instructions.

Assessor guide: observe that –

Emergency procedures are demonstrated during a simulated emergency or drill.

Assessor guide: confirm that –

The procedures to be followed in the event of an emergency can be identified.

Element 13.3A.3 Observe safe working practices

Criteria 13.3A.3.1

Hazardous areas and materials are identified and special handling procedures identified and understood.

Assessor guide: observe that –

Assessor guide: confirm that –

The hazardous areas and materials can be identified. Any special handling requirements for the industrial chemicals/materials being used can be identified. The consequences of inappropriate handling of hazardous materials can be given.

Criteria 13.3A.3.2

All equipment and hazardous materials are used in accordance with specifications and correct procedures.

Assessor guide: observe that –

All equipment and hazardous materials are used in accordance with specifications and work site procedures.

Assessor guide: confirm that –

The correct use of equipment and hazardous materials can be identified.

Criteria 13.3A.3.3

All safety signs, symbols and labels are correctly identified and understood.

Assessor guide: observe that –

Assessor guide: confirm that –

Common safety signs, symbols and labels can be interpreted correctly. The sources of additional information with respect to hazardous materials can be identified.

Criteria 13.3A.3.4

Material safety data sheets understood and applied.

Assessor guide: observe that –

The appropriate material safety data sheets are obtained in accordance with work site procedures. The requirements of the material safety data sheets are followed while handling hazardous materials in accordance with work site procedures.

Assessor guide: confirm that –

The appropriate material safety data sheet for hazardous materials used can be identified.

Criteria 13.3A.3.5

Safe manual handling procedures are used.

Assessor guide: observe that –

All manual handling undertaken safely and in accordance with work site procedures.

Assessor guide: confirm that –

Safe manual handling procedures can be identified.

Criteria 13.3A.3.6

Housekeeping duties are performed according to standard operating procedure to maintain a safe working environment.

Assessor guide: observe that –

Housekeeping duties are performed in accordance with work site procedures.

Assessor guide: confirm that –

The consequences of not maintaining a clean and safe working environment can be given.

Range statement

This unit may be applied in a workplace in which materials and chemicals which are subject to codes and regulations are stored and used, for example, chemicals, explosives, solvents, dangerous materials, acids, noxious waste products etc. Personal protection includes goggles, filter masks, air helmets, safety boots and appropriate clothes/garments. This unit describes the competencies which are beyond those safety requirements normally applied in the workplace as described in Unit 1.2F (Apply principles of Occupational Health & Safety (OH&S) in work environment) or specifically described in individual units such as Welding.

Evidence guide

Assessment context

This unit should be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with working with industrial chemicals and materials, or other units requiring the exercise of the skills and knowledge covered by this unit.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. - All safety clothing and personal safety equipment. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities.

Unit MEM 13.4A A Work safely with molten metals/glass

Band – Specialisation band A

Field – Occupational health & safety

Unit Weight 2

Element 13.4A.1 Use personal protection equipment

Criteria 13.4A.1.1

Appropriate safety clothing used correctly, as specified in Standard Operating Procedure (SOP).

Assessor guide: observe that –

Appropriate safety clothing and personal safety equipment is used correctly in accordance with standard operating procedures.

Assessor guide: confirm that –

The hazards associated with molten metal/glass can be identified. The appropriate safety clothing and personal safety equipment required when working with molten metal/glass can be identified.

Element 13.4A.2 Identify emergency procedures

Criteria 13.4A.2.1

Emergency procedures demonstrated as laid down in approved safety instructions.

Assessor guide: observe that –

Emergency procedures are demonstrated during a simulated emergency or drill.

Assessor guide: confirm that –

The procedures to be followed in the event of an emergency can be identified.

Element 13.4A.3 Observe safe working practices

Criteria 13.4A.3.1

Hazardous areas and materials identified.

Assessor guide: observe that –

Assessor guide: confirm that –

The hazardous areas and materials can be identified.

Criteria 13.4A.3.2

Safety signs and symbols identified and understood.

Assessor guide: observe that –

Assessor guide: confirm that –

Common safety signs and symbols can be interpreted correctly.

Criteria 13.4A.3.3

Equipment used according to specifications and standard operating procedures.

Assessor guide: observe that –

All equipment is used in accordance with specifications and standard operating procedures.

Assessor guide: confirm that –

The correct use of equipment can be identified. The procedures for using the equipment can be given.

Criteria 13.4A.3.4

Equipment is maintained in good order.

Assessor guide: observe that –

All equipment is maintained in good order in accordance with standard operating procedures.

Assessor guide: confirm that –

The routine maintenance procedures for equipment used in conjunction with molten metal/glass can be identified. The frequency with which routine maintenance should be carried out can be identified.

Criteria 13.4A.3.5

Hazardous items identified and removed from hot material area.

Assessor guide: observe that –

Where appropriate, all hazardous items are removed from hot material areas in accordance with standard operating procedures.

Assessor guide: confirm that –

Items that are likely to be a hazard if encountered in a hot material area can be identified. The procedures for removing hazardous items from hot material areas can be identified. Where appropriate, the person(s) to be notified of hazardous items in a hot material area can be identified.

Criteria 13.4A.3.6

Housekeeping duties performed according to standard operating procedure to maintain a safe working environment.

Assessor guide: observe that –

Housekeeping duties are performed in accordance with standard operating procedures.

Assessor guide: confirm that –

The consequences of not maintaining a clean and safe working environment can be given.

Element 13.4A.4 Identify hazardous conditions operating in a heavy engineering environment**Criteria 13.4A.4.1**

Hazards identified and planning undertaken to maintain safe work environment.

Assessor guide: observe that –

Where appropriate, hazardous conditions are identified and reported/actioned in accordance with standard operating procedures. The work environment is maintained free of hazards at all times.

Assessor guide: confirm that –

The hazards associated with working in a heavy engineering environment can be explained. All hazardous areas and materials can be identified. The procedures for rectifying identified hazards can be given. The planning necessary to maintain a safe work environment can be identified.

Range statement

This unit may be applied in all workplaces in which there is molten metal or molten glass, for example, foundries, die casting operations, glass operations or molten glass etc. All work and work practices undertaken to regulatory and legislative requirements.

Evidence guide

Assessment context

This unit should be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with working with molten metal/glass or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 13.5B A Manage occupational health and safety for a workplace or section of a workplace

Band – Specialisation band B

Field – Occupational health & safety

Unit Weight 12

This unit covers the competencies required to assist in the development of OHS policy, understand and implement OHS principles for prevention of injury and disease through progressive use of the hierarchy of control, perform safety audits of the workplace, and maintain accident/incident records and statistics.

Pre-requisite units - Path 1

13.2A Undertake Occupational Health & Safety activities in the workplace

Element 13.5B.1 Assist in development and implementation of OHS policy

Criteria 13.5B.1.1

Discussions with consultative forums on OHS matters facilitated

Assessor guide: observe that –

Records/minutes of discussions with consultative forums on OHS matters are kept Meetings with the relevant consultative forums to discuss OHS matters are scheduled The individual participates appropriately in consultation forum discussions

Assessor guide: confirm that –

The procedures for initiating discussions with the relevant consultative forums can be given The relevant consultative forums can be identified The frequency of discussions to be held with the relevant consultative forums can be identified

Criteria 13.5B.1.2

Healthy and safe work practices and procedures developed

Assessor guide: observe that –

Appropriate records are kept for monitoring the effectiveness of work practices and procedures with respect to the safety of the working environment

Assessor guide: confirm that –

The work practices and procedures developed in conjunction with the relevant consultative forums can be identified The effect of those work practices and procedures on the safety of the working environment can be explained The procedures for monitoring the success of the work practices and procedures developed can be given The variables to be recorded during the monitoring process can be identified The sources of information on occupational health and safety issues can be identified

Element 13.5B.2 Understand and implement OHS principles of prevention of injury and disease through progressive use of hierarchy of control of hazards

Criteria 13.5B.2.1

Accident investigations conducted with view to discovering cause

Assessor guide: observe that –

Where appropriate, accidents are investigated in accordance with standard operating procedures

Assessor guide: confirm that –

The procedures for conducting accident investigations can be given The hierarchy of control of hazards can be identified The reasons for progressively implementing the hierarchy of control of hazards can be explained Where appropriate, the likely causes of accidents investigated can be identified

Element 13.5B.3 Perform safety audit of workplace in accordance with relevant regulations and codes of practice

Criteria 13.5B.3.1

Areas requiring hazard rectification identified

Assessor guide: observe that –

The results of safety audits are obtained in accordance with work place procedures

Assessor guide: confirm that –

The hazards to be rectified can be identified

Criteria 13.5B.3.2

Preferred hazard control mechanisms in context of good OHS principles identified

Assessor guide: observe that –

Assessor guide: confirm that –

The principles of hazard control can be given The mechanisms for controlling hazards can be identified

Criteria 13.5B.3.3

The need for expert advice to identify and control hazards identified

Assessor guide: observe that –

Where appropriate, expertise external to the workplace is obtained to assist in the identification and control of workplace hazards

Assessor guide: confirm that –

The areas of occupational health and safety for which the workplace lacks acknowledged expertise can be identified The procedures for accessing expertise external to the workplace can be given

Element 13.5B.4 Maintain accident records and statistics

Criteria 13.5B.4.1

Accident/incident records maintained

Assessor guide: observe that –

Accident and incident records are maintained in accordance with standard operating procedures

Assessor guide: confirm that –

The procedures for recording accidents and incidents can be given

Criteria 13.5B.4.2

Records analysed for trends or particular problem areas identified

Assessor guide: observe that –

Assessor guide: confirm that –

The accident and incident reports are analysed and any trends or problem areas are identified The probable causes of the trends or problem areas detected can be explained

Range statement

This unit applies to a person who requires the skill and knowledge to manage the Occupational Health and Safety (OHS) of a workplace or section of a workplace.

Evidence**Assessment context**

This unit should be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the management of occupational health and safety in the workplace or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 13.6A A Monitor occupational health and safety factors for an enterprise or section of an enterprise

Band – Specialisation band A

Field – Occupational health & safety

Unit Weight 4

This unit covers the competencies required to carry out standard OHS measurements, evaluate data, maintain records and report hazards. The measurements would be of a

routine type and data collected would typically relate to factors associated with temperature, noise (noise meter) and dust (draeger tubes).

Element 13.6A.1 Carry out standard OHS measurement

Criteria 13.6A.1.1

Data collected using standard equipment in accordance with manufacturer's specifications

Assessor guide: observe that –

The required measurements are accurately taken and recorded in accordance with manufacturer's specifications and standard operating procedures

Assessor guide: confirm that –

The measurements to be taken and recorded can be identified The procedures for taking each type of measurement can be given The tools, techniques and equipment required to carry out the measurements can be identified

Element 13.6A.2 Evaluate data

Criteria 13.6A.2.1

Data from measurements taken evaluated to identify non-conformance with OHS standards

Assessor guide: observe that –

Assessor guide: confirm that –

The OHS standards for each factor being measured can be identified Any variations between the data collected and the appropriate OHS standard can be identified Where appropriate, the probable causes of the variation of the data collected from the OHS standard can be explained

Element 13.6A.3 Maintain records

Criteria 13.6A.3.1

Records are maintained in accordance with standard operating procedures

Assessor guide: observe that –

The records of the OHS factors monitored are maintained in accordance with standard operating

Assessor guide: confirm that –

The procedures for maintaining records of OHS factors measured can be given

Element 13.6A.4 Hazards reported

Criteria 13.6A.4.1

Results requiring remedial action are reported to appropriate personnel using standard operating procedures

Assessor guide: observe that –

Where appropriate, hazards detected are reported in accordance with standard operating procedures

Assessor guide: confirm that –

The procedures for reporting hazards detected can be given The authority to whom hazards are to be reported can be identified

Range statement

Measurements taken would be of a routine type. Where complex procedures or complex analysis are required, the services of an Occupational Health and Safety (OHS) hygienist should be accessed. Data collected would typically relate to factors associated with temperature, noise (noise meter), dust (draeger tubes). This unit should not also be selected where Unit 15.10B (Perform laboratory procedures) has been selected.

Evidence**Assessment context**

This unit should be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the monitoring of occupational health and safety factors for the enterprise, or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 13.7A A Maintain water cooling towers and treatment systems

Band – Specialisation band A

Field – Occupational health & safety

Unit Weight 2

Pre-requisite units - Path 1

18.1A Use hand tools

Element 13.7A.1 Apply principles of Australian Standard 3666 or equivalent

Criteria 13.7A.1.1

Causes of corrosion, scale, algae and treatment/prevention understood.

Assessor guide: observe that –

Assessor guide: confirm that –

The causes of corrosion, scale and algae can be explained. Appropriate methods of treating/preventing occurrence of corrosion, scale and/or algae in water cooling towers and treatment systems can be identified.

Criteria 13.7A.1.2

Psychometrics of cooling towers, legionella precautions and AS3666 and/or other relevant regulations understood.

Assessor guide: observe that –

Assessor guide: confirm that –

The psychometrics of cooling tower operation can be explained. The requirements of AS3666 and/or other relevant regulations pertaining to water cooling towers and treatment systems can be identified. The precautions to be taken to prevent contamination of the systems by legionella bacteria can be explained.

Element 13.7A.2 Assess reticulation system

Criteria 13.7A.2.1

Relevant water conditions assessed against specifications using standard procedures and test equipment.

Assessor guide: observe that –

The condition of the water in the cooling tower/treatment system is tested in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for testing the condition of the water in the cooling tower and/or treatment system can be given. The specifications of the water condition can be identified. The test equipment and techniques required to test the condition of the water can be identified.

Criteria 13.7A.2.2

Condition of water circulation system assessed and appropriate action determined.

Assessor guide: observe that –

Assessor guide: confirm that –

The results of the water condition tests are compared with the water specifications. Variations of the test results from specification can be identified. The procedures to be followed when variations of water condition from specification are detected can be given.

Criteria 13.7A.2.3

Regulating, filtering, conditioning/dosing, pumping systems performance tested.

Assessor guide: observe that –

The reticulation system components are tested for correct operation/performance using appropriate equipment and techniques in accordance with standard operating procedures.

Assessor guide: confirm that –

The correct operation/performance of the following reticulation system components can be described: - regulators - filters - conditioners - pumps. The tests to be applied to each of the system components to check their performance can be identified. The procedures for testing reticulation system components can be given. The test equipment and techniques can be identified.

Element 13.7A.3 Measure water properties**Criteria 13.7A.3.1**

Test equipment correctly used and applied.

Assessor guide: observe that –

The water properties are tested using appropriate techniques and equipment in accordance with standard operating procedures.

Assessor guide: confirm that –

The water properties to be tested can be identified. The procedure for testing water properties can be given. The appropriate test equipment and techniques can be identified.

Criteria 13.7A.3.2

Relevant water properties accurately determined and recorded.

Assessor guide: observe that –

The test results are determined and accurately recorded.

Assessor guide: confirm that –

Element 13.7A.4 Maintain reticulation/treatment systems**Criteria 13.7A.4.1**

Water temperature control system correctly adjusted to specification.

Assessor guide: observe that –

The water temperature control system is adjusted to specification in accordance with standard operating procedures.

Assessor guide: confirm that –

The water temperature specifications can be identified.
The procedures for adjusting the water temperature can be given.

Criteria 13.7A.4.2

System flow adjusted to specification and sub-systems correctly balanced.

Assessor guide: observe that –

The water flow in the system is adjusted to specification and sub-systems correctly balanced in accordance with standard operating procedures.

Assessor guide: confirm that –

The water flow specifications can be identified. The procedures for adjusting water flow and balancing sub-systems can be given.

Criteria 13.7A.4.3

Faults reported to appropriate personnel according to standard operating procedure.

Assessor guide: observe that –

Where appropriate, system faults are reported to appropriate personnel in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for reporting system faults can be given.
The person to whom faults are to be reported can be identified.

Range statement

This unit refers to maintenance activities associated with large water reticulation systems. Work is carried out within specifications of State Health regulations or equivalent, or Australian Standard - AS3666.

Evidence guide

Assessment context

This unit should be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the maintenance of water cooling towers and treatment systems or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 13.13A A Work safely with ionizing radiation

Band – Specialisation band A

Field – Occupational health & safety

Unit Weight 4

Element 13.13A.1 Identify the hazards and effects of ionizing radiation in the workplace

Criteria 13.13A.1.1

Production of x-rays and gamma rays is explained in relation to radiographic testing activities.

Assessor guide: observe that –

Assessor guide: confirm that –

Properties of x-rays and gamma rays and principal radioactive sources used in industrial radiography can be explained.

Criteria 13.13A.1.2

Attenuation factors of ionizing radiation and the biological effects on living tissue are outlined.

Assessor guide: observe that –

Assessor guide: confirm that –

Attenuation factors can be explained.

Criteria 13.13A.1.3

The biological effects of radiation are identified.

Assessor guide: observe that –

Effects of radiation are recognised.

Assessor guide: confirm that –

The known biological effects of radiation can be explained.

Element 13.13A.2 Apply radiation exposure limits and controls

Criteria 13.13A.2.1

S. I. units of radiation are explained as per the National Health and Medical Research Council/ statutory requirements.

Assessor guide: observe that –

Assessor guide: confirm that –

The different SI units of radiation can be explained, including:

- becquerel
- sievert
- gray

Criteria 13.13A.2.2

Exposure limits for personnel as laid down by the radiation authorities in Australia are stated and adhered to.

Assessor guide: observe that –

Assessor guide: confirm that –

Exposure limits for personnel as laid down by the radiation authorities in Australia can be stated.

Criteria 13.13A.2.3

Minimum exposure rates/distances are determined from calculations and charts.

Assessor guide: observe that –

Calculations are performed and charts interpreted correctly.

Assessor guide: confirm that –

The three exposure reduction factors can be explained, including:

- time
- distance
- shielding

Element 13.13A.3 Select and use radiation monitoring equipment**Criteria 13.13A.3.1**

The tools and equipment necessary to monitor radiation are selected and used as required.

Assessor guide: observe that –

Correct monitoring equipment is utilised.

Assessor guide: confirm that –

The procedures for establishing safe working barriers can be explained.

Criteria 13.13A.3.2

Techniques and system verification checks necessary to monitor radiation are selected and applied.

Assessor guide: observe that –

Radiation is monitored effectively.

Assessor guide: confirm that –

Relevant techniques and checks can be explained.

Element 13.13A.4 Respond to emergency situations**Criteria 13.13A.4.1**

Procedures for dealing with both x-ray and gamma-ray emergency situations are demonstrated.

Assessor guide: observe that –

Emergency response procedures are carried correctly and in a logical sequence.

Assessor guide: confirm that –

Emergency procedures can be explained. Emergency situations, causes and appropriate responses can be fully explained.

Range statement

This unit describes the underpinning safety knowledge and skills required that must be applied when working with ionizing radiation in open or closed sites; on fabrications, structures and components across a wide range of industries. It is a pre-requisite to undertaking any other radiographic competency standards unit. The work can relate to scheduled and un-scheduled maintenance activities, using general tools, specific radiographic testing equipment as specified in maintenance documentation, testing procedures or operators instructions.

All testing must be completed with particular attention to personal and OH&S regulations. Certification against Australian Standards may be achieved where assessment in this unit of competency is carried out in conjunction with an examining authority as described in ISO 9712. Materials and chemicals, which are subject to codes and regulations, for example, chemicals, explosives, solvents, dangerous materials, acids, or noxious waste products safe work habits must be stored and used in accordance with safe work practices.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or through a combination of both on and off the job. An individual working alone or as part of a team would demonstrate the competencies covered in this unit. The assessment environment should not disadvantage the candidate.

Assessment conditions

The candidate will be provided with:-

- all tools, equipment, materials and documentation required.

The candidate will be permitted access to the following documents: -

- any relevant workplace procedures;
- any relevant product and manufacturing specifications;
- any relevant codes, standards, manuals and reference materials.

The candidate will be required to:

- orally, or by other methods of communication, answer questions put by the assessor about processes, events or tasks being undertaken;
- identify colleagues who can be approached for the collection of competency evidence, where appropriate;
- present evidence of any off-job training related to this unit
- perform the tasks within the time frames established between the candidates supervisor/instructor and the assessor, prior to the assessment;

Assessors must be satisfied that the candidate can competently and consistently perform all elements of this unit as specified by the criteria, including required knowledge.

Activities should closely simulate a workplace environment and conditions due to the critical nature of this work.

Critical aspects

The candidate should demonstrate sufficient underpinning knowledge of:

- OH&S requirements
- metallurgy associated with the level of application in this unit
- take responsibility for the quality of their own work;

This unit could be assessed in conjunction with other units addressing the safety, quality, communication, materials handling, recording and reporting associated with non-destructive testing in accordance with relevant standards and procedures, or other units requiring the exercise of skills and knowledge covered in this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Special notes

During assessment the individual will:

- demonstrate safe working practices at all times;
- communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment;
- plan tasks in all situations and review task requirements as appropriate;
- perform all tasks to specifications and use accepted NDT techniques, practices, processes and workplace procedures;
- tasks will be completed within reasonable time frames relating to typical workplace activities.

Unit MEM 14.1B A Schedule material deliveries

Band – Specialisation band B

Field – Planning

Unit Weight 8

Notes - This unit can be regarded as a Specialisation band A unit from C11 onwards

Element 14.1B.1 Identify material requirements

Criteria 14.1B.1.1

Materials required are identified from appropriate documentation including type and quality.

Assessor guide: observe that –

The appropriate documentation for a given product is obtained in accordance with workplace procedures.

Assessor guide: confirm that –

The material type(s) and quality required can be identified.

Criteria 14.1B.1.2

Quantities required are estimated in accordance with standard operating procedures.

Assessor guide: observe that –

Assessor guide: confirm that –

The material requirements and specifications can be identified. The procedures for estimating quantities can be given. The quantities of material required are estimated in accordance with standard operating procedures.

Element 14.1B.2 Schedule material delivery

Criteria 14.1B.2.1

Delivery requirements and dates are determined from production plans, or job sequencing requirements.

Assessor guide: observe that –

Material deliveries are scheduled in accordance with the requirements of the job/process/production targets and standard operating procedures.

Assessor guide: confirm that –

The material ordering/requisitioning procedures can be identified. The material delivery requirements can be identified. The effects of non-availability of materials on production plans and/or job sequencing can be explained. The procedures for determining lead times for material supply can be given. The procedures for determining material stock levels can be given.

Criteria 14.1B.2.2

Material supply followed up and problems reported

Assessor guide: observe that –

Material supply orders/requisitions are followed up in accordance with standard operating procedures. Where appropriate, problems with material supply are reported in accordance with standard operating procedures.

Assessor guide: confirm that –

The material supply procedures can be given. The persons responsible for material supply can be identified. The persons to whom material supply problems are to be reported can be identified.

Criteria 14.1B.2.3

Material orders are processed in accordance with established organisational practice and procedures.

Assessor guide: observe that –

Material orders are processed in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for requisitioning/ ordering materials can be given. The consequences of not following organisational procedures for material supply can be explained.

Range statement

This unit applies to the estimating, planning, scheduling of material delivery requirements for production process purposes so that materials are available in quantities and specifications required. Scheduling is undertaken in accordance with established organisational practices and procedures, based on familiar processes. If scheduling is based on engineering drawings and supporting engineering data, appropriate skill units should be accessed. This unit is not intended to be used by personnel carrying out maintenance and installation.

Evidence guide

Assessment context

This unit should be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the scheduling of material deliveries or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 14.2B A Basic process planning

Band – Specialisation band B

Field – Planning

Unit Weight 8

Notes - Appropriate technical units relating to the process being planned are also required.

Element 14.2B.1 Review process specifications

Criteria 14.2B.1.1

Supporting engineering and production data is examined, where required.

Assessor guide: observe that –

Where appropriate, relevant engineering and production data is obtained in accordance with work place procedures.

Assessor guide: confirm that –

The role of engineering and production data in process planning can be explained.

Criteria 14.2B.1.2

The production processes to be used are determined.

Assessor guide: observe that –

Assessor guide: confirm that –

The production processes to be used can be identified.

Criteria 14.2B.1.3

Specifications are obtained and examined.

Assessor guide: observe that –

All relevant job instructions, drawings, specifications and procedures are obtained in accordance with workplace procedures.

Assessor guide: confirm that –

The specifications of the product to be produced can be given.

Element 14.2B.2 Determine production sequence

Criteria 14.2B.2.1

Steps required for the process are identified and flow charts produced where required.

Assessor guide: observe that –

Where appropriate, the production process is represented by a flow chart in accordance with workplace procedures.

Assessor guide: confirm that –

The individual steps in the production process can be identified. The reasons for selecting the chosen steps and sequence of operations can be explained. The reasons for producing flow charts of production processes can be given.

Criteria 14.2B.2.2 Material and parts lists are prepared.	<i>Assessor guide: observe that –</i> Material and parts lists are prepared for the production process in accordance with standard operating procedures.	<i>Assessor guide: confirm that –</i> The procedures for preparing material and parts lists can be given.
Criteria 14.2B.2.3 Tooling and/or equipment requirements are documented.	<i>Assessor guide: observe that –</i> Tooling and/or equipment requirements are documented in accordance with standard operating procedures.	<i>Assessor guide: confirm that –</i> The procedures for documenting tooling and equipment requirements can be given.
Criteria 14.2B.2.4 Quality assurance steps and specifications are identified.	<i>Assessor guide: observe that –</i> Where appropriate, the quality assurance steps are included in the process flow chart in accordance with workplace procedures.	<i>Assessor guide: confirm that –</i> The quality assurance procedures can be given. The specifications of the product can be identified. The quality assurance steps in the production process can be identified.
Criteria 14.2B.2.5 Process steps are documented and clearly represented.	<i>Assessor guide: observe that –</i> The process steps are clearly documented in accordance with standard operating procedures.	<i>Assessor guide: confirm that –</i> The procedures for documenting process plans can be given.

Range statement

Applies to one of a range of processes in manufacturing eg: machining, pressing, assembly. Applies to a stage of the overall production process. Does not apply to interfacing between processes. Work for the process element is planned over the specified timeframe taking into account resources available and required. Process plan establishes detailed steps required, and milestones against which progress can be checked. Plan is developed in accordance with accepted organisation practice and procedures. If planning is based on engineering drawings and supporting engineering data, appropriate skills units should be accessed.

Evidence guide

Assessment context

This unit should be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with process planning or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 14.3B A Undertake basic production scheduling

Band – Specialisation band B

Field – Planning

Unit Weight 8

Notes - This unit can be regarded as a Specialisation band A unit from C11 onwards. Appropriate technical units relating to the production/manufacturing process also required.

Element 14.3B.1 Identify production requirements and capacities

Criteria 14.3B.1.1

Engineering production data is identified.

Assessor guide: observe that –

All relevant production data is obtained in accordance with work place procedures.

Assessor guide: confirm that –

The source of engineering production data can be identified.

Criteria 14.3B.1.2

Inventory capacities and requirements are identified.

Assessor guide: observe that –

Assessor guide: confirm that –

The inventory capacity can be identified. The inventory requirements can be identified. The persons responsible for determining inventory levels can be identified.

Criteria 14.3B.1.3

Procurement and supply requirements and constraints are identified.

Assessor guide: observe that –

Assessor guide: confirm that –

The materials required to produce the given product can be identified. The material supply procedures can be given. The material supply lead times can be identified. The effect of material supply lead times on production scheduling can be explained.

Criteria 14.3B.1.4

Production capacity and constraints are identified.

Assessor guide: observe that –

Assessor guide: confirm that –

The production capacity for given products can be identified. The factors affecting production capacity can be explained.

Criteria 14.3B.1.5
Standard times are identified.

Assessor guide: observe that –

Assessor guide: confirm that –
The sources of information on standard times can be identified. The standard times for given manufacturing processes can be identified.

Element 14.3B.2 Prepare schedule for production of a component/part

Criteria 14.3B.2.1
Production of component is scheduled in accordance with production, inventory, procurements, time constraints, supply capacities and requirements.

Assessor guide: observe that –
The production schedule for given component(s) is produced in accordance with standard operating procedures.

Assessor guide: confirm that –
The procedures for scheduling production can be given. The factors to be considered when scheduling production and their impact on the schedule produced can be explained. The persons to be consulted during the scheduling process can be identified. The procedures for revising production schedules to take account of unforeseen occurrences can be given.

Criteria 14.3B.2.2
Schedule is documented in accordance with accepted organisation procedures.

Assessor guide: observe that –
The production schedule is documented in accordance with standard operating procedures.

Assessor guide: confirm that –
The procedures for documenting production schedules can be given.

Range statement

Applies to the scheduling of the manufacture of a single component; the scheduling of a single assembly function; or for a single small production work unit or production cell, or work station or work unit; or a single production process where there are only a small number of constraints or variables. The scheduling applies to only a part of the overall production process.

Evidence guide

Assessment context

This unit should be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with production scheduling or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities.

Unit MEM 15.1A A Perform basic statistical quality control

Band – Specialisation band A

Field – Quality

Unit Weight 2

Element 15.1A.1 Take samples

Criteria 15.1A.1.1

Difference between population and sample understood and various sampling schemes applied in accordance with standard operating procedures.

Assessor guide: observe that –

The appropriate sampling scheme is applied to the given production process in accordance with standard operating procedures.

Assessor guide: confirm that –

The difference between population and sample can be explained. A variety of sampling schemes and their application can be given. The sampling scheme to be applied to a given situation can be identified. The reasons for selecting the chosen sampling scheme can be given. The sampling procedures to be followed can be given.

Element 15.1A.2 Apply statistical process to monitor production

Criteria 15.1A.2.1

Concept of variation in terms of average and spread understood. Data used to produce relevant statistical information eg: average and range and the plotting of charts such as tally, run or control charts.

Assessor guide: observe that –

Data produced from samples taken in conformance to sampling procedures is obtained in accordance with standard operating procedures. Where appropriate, tally, run or control charts are produced from sampling data.

Assessor guide: confirm that –

The concept of variation can be explained in terms of average and spread. The procedures for obtaining sampling data can be given. The average and range of given sampling data can be determined. The types of charts that can be produced to assist in the monitoring of products can be identified.

Criteria 15.1A.2.2

Data interpreted accurately and information presented to appropriate authority utilising standard operating procedure.

Assessor guide: observe that –

Information identified from sampling data is reported to the appropriate authority in accordance with standard operating procedures.

Assessor guide: confirm that –

The information contained in given sampling data can be interpreted accurately. The procedures for reporting information obtained from sampling data can be given. The person to whom information obtained from sampling data is to be reported can be identified.

Range statement

This unit is intended to apply to the collation and interpretation of statistical data in the context of statistical quality control, for example, tally, run or control charts. When the production and interpretation of charts and graphs not dependent on knowledge and understanding of the implications for quality are required, Unit 2.8C10 (Perform computations) should be accessed. Uncontrolled variations are reported to appropriate authority.

Evidence guide**Assessment context**

This unit should be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with statistical quality control or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 15.3A A Use improvement processes in team activities

Band – Specialisation band A

Field – Quality

Unit Weight 4

Pre-requisite units - Path 1

2.3C11 Operate in a work based team environment

Element 15.3A.1 Identify areas for improvement and/or solve problems

Criteria 15.3A.1.1

Participate in team selection of improvement tools and methods appropriate to the situation.

Assessor guide: observe that –

The individual participates in the team's selection of the improvement tools and methods to be used.

Assessor guide: confirm that –

Improvement tools and methods that may be applied to the situation/ problem can be identified. A preferred improvement tool and/or method can be identified. The reasons for selecting the preferred improvement tool and/or method can be explained.

Criteria 15.3A.1.2

Working in teams, process improvement tools are used to identify improvements and/or solve problems.

Assessor guide: observe that –

The process improvement tools are used by the team to identify improvements and/or solve problems.

Assessor guide: confirm that –

The procedures to be followed when using process improvement tools in the team environment can be explained. The individual's role in identifying improvements and/or solving problems can be identified.

Element 15.3A.2 Implement improvement strategy

Criteria 15.3A.2.1

Working in teams, improvement strategies are implemented as required in accordance with standard operating procedures.

Assessor guide: observe that –

The individual participates in the implementation of improvement strategies in accordance with standard operating procedures.

Assessor guide: confirm that –

The improvement strategies to be implemented can be identified. The reasons for implementing the improvement strategies can be explained. The procedures for implementing the improvement strategies can be given. The individual's role in implementing the improvement strategies can be identified.

Criteria 15.3A.2.2

In conjunction with work team further action recommended where required using standard operating procedure.

Assessor guide: observe that –

Where appropriate, further action is recommended in accordance with standard operating procedures.

Assessor guide: confirm that –

Where appropriate, further action to be taken by the individual and/or the work team can be identified. The procedures for initiating further action can be identified.

Element 15.3A.3 Monitor implementation of improvement**Criteria 15.3A.3.1**

Performance monitored for change utilising feedback data.

Assessor guide: observe that –

The appropriate feedback data is collected and collated in accordance with standard operating procedures.

Assessor guide: confirm that –

The data necessary to measure the results of the implementation of the improvement strategy can be identified. The procedures for collecting and collating feedback data can be identified. The desired performance can be identified. Any discrepancies between desired and actual performance can be identified. The performance trends can be identified from the data collected.

Element 15.3A.4 Evaluate improvement**Criteria 15.3A.4.1**

Analytical tools used to evaluate improvement as required.

Assessor guide: observe that –

Where appropriate, analytical tools are used to evaluate the improvement strategy implemented in accordance with standard operating procedures.

Assessor guide: confirm that –

The analytical tools to be used to evaluate the improvement strategy implemented can be identified. The procedures for evaluating improvement can be given.

Criteria 15.3A.4.2

In conjunction with work team further action recommended where required using standard operating procedure.

Assessor guide: observe that –

Where appropriate, further action is recommended in accordance with standard operating procedures.

Assessor guide: confirm that –

Where appropriate, further action to be taken by the individual and/or the work team can be identified. The procedures for initiating further action can be identified.

Range statement

This unit applies to the skills required for quality circle participation using problem solving techniques. Techniques should include flow charts, cause and effect diagrams, pareto charts, histograms, run charts and graphs, control charts, scattergrams etc. as required.

Evidence guide

Assessment context

This unit should be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the use of improvement processes or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 15.4A A Perform inspection (basic)

Band – Specialisation band A

Field – Quality

Unit Weight 2

Element 15.4A.1 Inspect products

Criteria 15.4A.1.1

Products tested for conformance to specifications in accordance with standard operating procedures.

Assessor guide: observe that –

Products are tested for conformance to specifications in accordance with work site procedures.

Assessor guide: confirm that –

The product specifications can be identified. The appropriate measurements/tests to check conformance to specifications can be identified.

Element 15.4A.2 Keep records

Criteria 15.4A.2.1

Test status identification is made on conforming and non-conforming products and records accurately kept using standard operating procedures.

Assessor guide: observe that –

Inspection results are recorded accurately in accordance with work site procedures. Individuals producing parts/products informed of part/product conformance/non-conformance to specification in accordance with work site procedures.

Assessor guide: confirm that –

The data to be recorded and the frequency of recording required can be identified. The consequences of not keeping accurate records can be given.

Element 15.4A.3 Provide feedback

Criteria 15.4A.3.1

Products tested/inspected/measured after rework or repair.

Assessor guide: observe that –

Reworked/repared products are tested for conformance to specification in accordance with work site procedures.

Assessor guide: confirm that –

The non-conformances of a product that can be removed by rework/repair can be identified.

Criteria 15.4A.3.2

Deficiencies or deviations reported to standard operating procedures.

Assessor guide: observe that –

Inspection results are recorded accurately in accordance with work site procedures. Individual reworking/repairing part informed of conformance/non-conformance of reworked/repared product to specification in accordance with work site procedures.

Assessor guide: confirm that –

The data to be recorded with respect to reworked/repared products can be identified.

Range statement

This unit applies to those whose duties include the basic inspection of completed or partly completed products produced by others. Inspection is carried out according to site quality plan or specifications, and applies to a range of manufacturing enterprises. Uses a range of measuring equipment/devices/tools. Location and frequency of checks/tests and measurements undertaken to standard operating procedures. In general, verification should be made as close as possible to the point of production of the feature or characteristic. Inspection may involve "first piece inspection", fixed interval, sample etc. Depending on the inspection process other technical units may need to be accessed, for example, appropriate measurement units. This unit is not intended to be applied to maintenance personnel carrying out their day-to-day activities, for example, fault finding, remedial and checking activities, these skills are covered by other units, eg. Unit 18.6A (Dismantle/repair/replace/assemble and fit engineering components).

Evidence guide

Assessment context

This unit should be assessed in the workplace. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the inspection process, or other units requiring the exercise of the skills and knowledge covered by this unit.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment, the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities.

Unit MEM 15.5A A Perform inspection (advanced)

Band – Specialisation band A

Field – Quality

Unit Weight 4

Pre-requisite units - Path 1

15.4A Perform inspection (basic)

Element 15.5A.1 Select inspection/test procedures

Criteria 15.5A.1.1

Appropriate methods of inspection selected and implemented.

Assessor guide: observe that –

Where appropriate, the relevant inspection method for the product/process is implemented in accordance with standard operating procedures.

Assessor guide: confirm that –

A range of inspection methods and their application can be identified. The appropriate inspection method for the process/product can be identified. The reasons for selecting the chosen inspection method can be explained. The procedures for implementing inspection methods can be identified.

Criteria 15.5A.1.2

Inspection/test procedures monitored to ensure desired outcomes.

Assessor guide: observe that –

The inspection/test procedures are monitored in accordance with standard operating procedures to ensure desired outcomes are achieved.

Assessor guide: confirm that –

The desired/target outcomes of the inspection/test procedures can be identified. The actual outcomes of the inspection/test procedures can be identified. Any discrepancies/trends detected from the inspection/test results can be identified. The reasons for any discrepancies/ trends detected can be explained. The procedures for monitoring inspection/test procedures can be identified.

Element 15.5A.2 Control inspection/test environment and equipment

Criteria 15.5A.2.1

Environmental conditions monitored to ensure reliability of tests and results.

Assessor guide: observe that –

Environmental conditions are monitored in accordance with standard operating procedures.

Assessor guide: confirm that –

The effects of environmental conditions on test equipment and the results obtained can be explained. The procedures for monitoring environmental conditions can be identified. The acceptable range of variations to environmental conditions can be identified.

Criteria 15.5A.2.2

Equipment/instruments checked for correct calibration.

Assessor guide: observe that –

The calibration of measuring equipment is checked for conformance to specifications using appropriate techniques in accordance with standard operating procedures and all relevant codes, standards and legislative/regulatory requirements.

Assessor guide: confirm that –

The correct operation of the measuring equipment can be identified. The specifications of the measuring equipment can be identified. The procedures for checking the calibration of the measuring equipment can be given. Any codes, standards, legislative or regulatory requirements applicable to the measuring equipment and/or calibration can be identified.

Criteria 15.5A.2.3

Calibration of equipment/instruments is initiated or undertaken against appropriate standard as required.

Assessor guide: observe that –

Where appropriate, the calibration of measuring equipment is initiated in accordance with standard operating procedures. Where appropriate, the measuring equipment is calibrated against the appropriate standard in accordance with standard operating procedures and all relevant codes, standards and legislative, regulatory requirements.

Assessor guide: confirm that –

Where appropriate, the procedures for initiating the calibration of measuring equipment can be identified. Where appropriate the physical standard against which the measuring equipment is to be calibrated can be identified. Where appropriate, the procedures for calibrating the measuring instrument can be given. Where appropriate, the tools and equipment required to calibrate the measuring equipment can be identified.

Criteria 15.5A.2.4

Calibration records maintained to standard operating procedure.

Assessor guide: observe that –

Calibration records are maintained in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for recording calibration details can be identified. The reasons for keeping calibration records can be explained.

Criteria 15.5A.2.5

If equipment/instruments are found to be out of calibration validity of previous results checked and reported to standard operating procedure.

Assessor guide: observe that –

Where appropriate, out of calibration equipment is detected and reported to the appropriate authority in accordance with standard operating procedures. Where appropriate, the results obtained with out of calibration measuring equipment are checked for validity in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures to be followed when measuring equipment is found to be out of calibration can be identified. The reasons for checking results obtained with out of calibration measuring equipment can be explained. The authority to whom out of calibration measuring equipment is to be reported can be identified.

Range statement

This unit applies to a range of manufacturing enterprise. Inspection involves working autonomously and taking responsibility for overseeing inspection processes and environment. Uses a wide range of equipment/instruments and takes responsibility for the reliability of inspection results to ensure conformance to specifications. This unit is not intended to be applied to maintenance personnel carrying out their day-to-day activities, for example, fault finding, remedial and checking activities, these skills are covered by other units, eg Unit 18.6A (Dismantle/repair/replace/assemble and fit engineering components).

Evidence guide

Assessment context

This unit should be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the inspection process or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 15.7B A Conduct product and/or process capability studies

Band – Specialisation band B

Field – Quality

Unit Weight 6

Pre-requisite units - Path 1

2.7C10 Perform computations - basic

2.8C10 Perform computations

2.14C5 Use graphical techniques and perform simple statistical computations

15.1A Perform basic statistical quality control

15.8B Perform advanced statistical quality control

Element 15.7B.1 Conduct process capability studies

Criteria 15.7B.1.1

Procedure for conducting capability study selected.

Assessor guide: observe that –

Assessor guide: confirm that –

The process to be studied can be identified. The procedure for conducting the process capability study can be given. The reasons for selecting the chosen procedure can be explained.

Criteria 15.7B.1.2

Instructions for personnel conducting trial run prepared.

Assessor guide: observe that –

Assessor guide: confirm that –

Criteria 15.7B.1.3

Data analysed and the process capability calculated

Assessor guide: observe that –

All relevant data is accurately collected and collated

Assessor guide: confirm that –

The data is used to calculate the process capability The procedures for calculating process capability can be given

Criteria 15.7B.1.4

Possible number of product defects from a particular process estimated

Assessor guide: observe that –

Assessor guide: confirm that –

The procedures for estimating the possible number of product defects can be given The possible number of product defects for given situations can be identified

Criteria 15.7B.1.5

Reports listing various options from process capability studies prepared

Assessor guide: observe that –

Reports listing the various options identified from the process capability study are prepared in accordance with workplace procedures

Assessor guide: confirm that –

The various options for improving the process can be identified The benefits of each option can be explained

Element 15.7B.2 Set control limits**Criteria 15.7B.2.1**

Optimum target mean to suit process capability determined.

Assessor guide: observe that –

Assessor guide: confirm that –

The procedures for determining the optimum target mean can be given. The optimum target mean can be identified.

Criteria 15.7B.2.2

Control limits for subgroup average, range and standard deviation calculated.

Assessor guide: observe that –

Assessor guide: confirm that –

The procedures for setting control limits can be given. The control limits can be calculated.

Criteria 15.7B.2.3

Warning limits for subgroup average, range and standard deviation calculated.

Assessor guide: observe that –

Assessor guide: confirm that –

The procedures for setting warning limits can be given. The warning limits can be calculated.

Criteria 15.7B.2.4

Course of action resulting from out of control situation and documented to standard operating procedure.

Assessor guide: observe that –

Assessor guide: confirm that –

The concept of "out of control" situations can be explained. The action to be taken when an "out of control" situation is detected can be identified. The procedures for documenting "out of control" situations can be given.

Criteria 15.7B.2.5

Design specifications based on an analysis of data recommended.

Assessor guide: observe that –

Process design specifications can be determined from process capability data.

Assessor guide: confirm that –

Element 15.7B.3 Select sampling plans**Criteria 15.7B.3.1**

Acceptable quality level determined.

Assessor guide: observe that –

Assessor guide: confirm that –

The acceptable level of quality can be identified.

Criteria 15.7B.3.2

Appropriate sampling plan to suit production schedule selected and acceptable quality limits determined, taking into account specified producer and consumer risks.

Assessor guide: observe that –

Assessor guide: confirm that –

A variety of sampling plans and their application can be given. The sampling plan to be applied to a given situation can be identified. The reasons for selecting the chosen plan can be given. The acceptable quality limits can be identified. The risks associated with identifying acceptable quality limits for the producer and customer can be explained.

Criteria 15.7B.3.3

Sampling plan documented including implementation strategy.

Assessor guide: observe that –

The sampling plan and implementation strategy are documented in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for documenting sampling plans can be given. The procedures for implementing sampling plans can be given.

Range statement

This unit includes the analysis of data from a production section or processes using appropriate statistical techniques. Consultation may be required with production or process personnel and is undertaken within the enterprise's total quality plan.

Evidence guide

Assessment context

This unit should be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the conduct of product or process capability studies or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 15.8B A Perform advanced statistical quality control

Band – Specialisation band B

Field – Quality

Unit Weight 2

Pre-requisite units - Path 1

2.7C10 Perform computations - basic

2.8C10 Perform computations

2.14C5 Use graphical techniques and perform simple statistical computations

15.1A Perform basic statistical quality control

Element 15.8B.1 Construct control charts

Criteria 15.8B.1.1

Control charts/proformas including the determination of control limits from sample data completed.

Assessor guide: observe that –

Control charts, including control limits are constructed from sample data in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for constructing control charts and control limits can be given.

Criteria 15.8B.1.2

State of controlled and uncontrolled variables understood and identified.

Assessor guide: observe that –

Assessor guide: confirm that –

The state of controlled and uncontrolled variables can be identified from given data.

Criteria 15.8B.1.3

Uses 1, 2 and 3 sigma limits to measure and describe population dispersion.

Assessor guide: observe that –

Assessor guide: confirm that –

Population dispersion can be described in terms of 1, 2 and 3 sigma limits. The population dispersion for given data can be calculated in terms of 1, 2 and 3 sigma limits.

Range statement

This unit involves the understanding of statistical processes and the application of these processes to the maintenance and improvement of a quality system.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with statistical quality control or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 15.10B A Perform laboratory procedures

Band – Specialisation band B

Field – Quality

Unit Weight 8

Element 15.10B.1 Work under laboratory conditions

Criteria 15.10B.1.1

Conduct independent tests under controlled conditions.

Assessor guide: observe that –

All relevant drawings, circuits, specifications, instructions and data are obtained in accordance with standard operating procedures. Tests are conducted independently under controlled conditions in accordance with standard operating procedures.

Assessor guide: confirm that –

The tests to be undertaken can be identified. The conditions under which the tests are to be undertaken can be identified. The testing procedures to be followed are established. The reasons for conducting tests under controlled conditions can be explained. The need for tests to be conducted independently can be explained.

Element 15.10B.2 Perform calibration

Criteria 15.10B.2.1

Equipment verified and calibrated to meet agreed quality standards.

Assessor guide: observe that –

The measuring equipment is checked for correct calibration against the agreed quality standards in accordance with standard operating procedures and the relevant codes, standards, legislative and regulatory requirements. Where appropriate, the measuring equipment is calibrated in accordance with standard operating procedures and relevant codes, standards, legislative and regulatory requirements.

Assessor guide: confirm that –

The quality standards against which the measuring equipment is to be calibrated can be identified. The correct operation of the measuring equipment can be identified. The specifications of the measuring equipment can be identified. The tools and equipment required to check the calibration of the measuring equipment can be identified. The procedures for checking the calibration of the measuring equipment can be given. Any codes, standards, legislative or regulatory requirements applicable to the measuring equipment and/or calibration can be identified.

Criteria 15.10B.2.2

Calibration status safeguarded against unauthorised adjustment of equipment.

Assessor guide: observe that –

The calibration status of the equipment is safeguarded against unauthorised adjustment in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for preventing unauthorised adjustment of equipment can be identified. The reasons for protecting equipment against unauthorised adjustment can be explained.

Criteria 15.10B.2.3

Accurate records kept for reference purposes.

Assessor guide: observe that –

Accurate records of measuring equipment calibrated are kept and maintained in accordance with standard operating procedures.

Assessor guide: confirm that –

The records to be kept with respect to the calibration of measuring equipment can be identified. The reasons for keeping accurate calibration records can be explained.

Criteria 15.10B.2.4

Test equipment periodically recalled for adjustment, repair and re-calibration.

Assessor guide: observe that –

Test equipment is recalled for adjustment, repair and re-calibration in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for recalling test equipment for adjustment, repair and re-calibration can be identified. The frequency of test equipment recall can be identified. The reasons for recalling test equipment can be explained.

Criteria 15.10B.2.5

Documentary evidence covering identification of equipment, frequency of re-calibration, calibration status and procedures for recall, handling and storage, adjustment, repair, calibration, installation and use maintained.

Assessor guide: observe that –

All relevant records are completed and maintained in accordance with standard operating procedures. All relevant documented procedures are maintained in accordance with standard operating procedures.

Assessor guide: confirm that –

All relevant documentation relating to the calibration/re-calibration of test equipment can be identified. The procedures for completing the relevant documentation can be identified. The procedures for the recall, handling, storage, adjustment, repair, installation and use of test equipment can be identified.

Criteria 15.10B.2.6

Calibration to reference standards of known accuracy such as national or international standards traced, or where these do not exist, to specifically developed criteria.

Assessor guide: observe that –

Reference standards or specific criteria are used as the basis for calibration.

Assessor guide: confirm that –

Sources of reference standards can be described, as well as procedures to be used in the absence of reference standards.

Element 15.10B.3 Write reports**Criteria 15.10B.3.1**

Results documented and reports provided as required.

Assessor guide: observe that –

All test results are documented in accordance with standard operating procedures. Where appropriate, reports are prepared/provided on the tests carried out on the test equipment in accordance with standard operating procedures.

Assessor guide: confirm that –

The reports to be prepared/provided with respect to the test equipment being tested can be identified. The procedures for preparing/ providing reports on tests carried out on test equipment can be identified.

Element 15.10B.4 Verify quality status**Criteria 15.10B.4.1**

Independent inspections, tests and audits conducted
Design and servicing process monitored.

Assessor guide: observe that –

Where appropriate, inspections, tests and audits are conducted in accordance with standard operating procedures. Where appropriate, the results of inspections, tests and audits are used to inform the design and servicing process.

Assessor guide: confirm that –

The auditing processes to be applied to testing procedures can be identified. The use of information from the inspections, tests and audits conducted in the development of design and servicing of products/equipment can be explained.

Range statement

This unit would apply to an individual working autonomously and following scientific procedures under controlled conditions. A range of sophisticated equipment used to provide independent feedback on quality processes and procedures. All work would be carried out to predetermined standard operating procedures. This unit would be taken in conjunction with appropriate technical units.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the performance of laboratory procedures or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 15.11B A Exercise external quality assurance

Band – Specialisation band B

Field – Quality

Unit Weight 6

Pre-requisite units - Path 1

15.4A Perform inspection (basic)

15.5A Perform inspection (advanced)

Element 15.11B.1 Liaise with external suppliers

Criteria 15.11B.1.1

The exact quality requirements communicated to suppliers.

Assessor guide: observe that –

The exact quality requirements are communicated to the supplier in accordance with standard operating procedures.

Assessor guide: confirm that –

The exact quality requirements of the product/material to be supplied can be identified. The procedures to be followed to ensure the supplier understands the quality requirements can be given.

Criteria 15.11B.1.2

Agreed quality assurance system negotiated.

Assessor guide: observe that –

The agreed quality assurance system is negotiated with the supplier in accordance with standard operating procedures.

Assessor guide: confirm that –

The requirements of a quality assurance system to ensure the supplied product/material conforms to the quality requirements can be given. The procedures for negotiating agreements with suppliers can be given.

Criteria 15.11B.1.3

Verification method and systems and procedures for dispute settlement established and agreed.

Assessor guide: observe that –

An appropriate system for recording and tracing products or services procured is implemented in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for verifying that the agreed quality assurance system is being utilised by the supplier can be given. The procedures for dispute resolution can be given.

Criteria 15.11B.1.4

Recording system of procured products or services which ensures traceability established.

Assessor guide: observe that –

An appropriate system for recording and tracing products or services procured is implemented in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for recording procured products or services can be given. The means of tracing procured products or services can be identified. The reasons for tracing procured products or services can be explained.

Element 15.11B.2 Check for conformance to specifications

Criteria 15.11B.2.1

The requirements of all relevant documentation including contract specifications, drawings and purchase orders obtained and understood.

Assessor guide: observe that –

All relevant drawings, specifications, documentation etc. are obtained in accordance with work place procedures.

Assessor guide: confirm that –

The specifications of the product/material to be supplied or service to be provided can be identified.

Criteria 15.11B.2.2

The conformance of the procured product or service to all of the documented requirements is established.

Assessor guide: observe that –

The product/material or service provided is checked for conformance to documented requirements/specifications.

Assessor guide: confirm that –

Any variations from documented requirements/specifications can be identified.

Element 15.11B.3 Assess external suppliers

Criteria 15.11B.3.1

Assessment and evaluation of suppliers' capability and/or quality system conducted.

Assessor guide: observe that –

Suppliers' capability to provide the required product/material or service is assessed in accordance with standard operating procedures. Suppliers' quality systems are evaluated in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for assessing/ evaluating a supplier's capability to supply the required product/material or service can be given. The procedures for evaluating a supplier's quality system can be given.

Criteria 15.11B.3.2

Suppliers' goods or services evaluated.

Assessor guide: observe that –

Suppliers' goods or services are evaluated in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for evaluating a supplier's goods or services can be given. Any equipment and techniques required to carry out the evaluation procedures can be identified.

Range statement

This standard is applied to a wide range of supplier enterprises so that purchased supplies meet quality standards and that adequate documents are prepared and maintained to standard operating procedures.

Evidence guide

Assessment context

This unit should be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the exercise of external quality assurance or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 15.12B A Maintain/supervise application of quality procedures

Band – Specialisation band B

Field – Quality

Unit Weight 4

Element 15.12B.1 Improve quality system

Criteria 15.12B.1.1

Specifications interpreted to meet customer needs (internal and external).

Assessor guide: observe that –

The specifications of the product or service to be provided are obtained in accordance with workplace procedures.

Assessor guide: confirm that –

The specifications to be achieved in providing the service or producing the product can be identified. The team's supplier(s) and customer(s) can be identified. The possible effects of supplying products and/or services to customers that do not comply with specifications can be explained.

Criteria 15.12B.1.2

Leadership role as a supplier in ensuring quality within a customer chain is taken.

Assessor guide: observe that –

The products and/or services supplied to the team's customer(s) conform to specifications at all times.

Assessor guide: confirm that –

The procedures to be followed in producing the product and/or supplying the service can be given. The checks to be undertaken to ensure the product/service complies with specifications can be identified. The personnel responsible for the quality of the product/service provided can be identified. The actions to be taken when a non-conformance to specifications is detected can be identified. The reasons for taking those actions can be explained.

Element 15.12B.2 Collect and summarise data**Criteria 15.12B.2.1**

Data recorded and interpreted accurately in accordance with standard operating procedures.

Assessor guide: observe that –

All data collected is accurately recorded in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for recording data collected can be given. The possible trends that can be identified from the collected data can be identified. The actual trends indicated by given samples of data can be correctly identified.

Criteria 15.12B.2.2

Data is used to produce relevant statistical information eg: average and range or the production of charts such as tally, run or control charts.

Assessor guide: observe that –

Where appropriate, relevant statistical information is correctly calculated from the collected data. Where appropriate, tally, run and control charts are produced from the collected data.

Assessor guide: confirm that –

The reasons for collecting data can be given. The statistical information to be calculated can be identified. The use of statistics in interpreting production data can be explained. The functions of tally, run or control charts in representing production data can be given. The trends indicated by the statistical information calculated and/or the charts produced can be correctly identified. The action to be taken in response to any trends identified can be stated. The reasons for taking the action proposed can be explained.

Range statement

Standards are applicable to the supervision or maintenance of a quality improvement system either individually or in a team situation. The definition of customer is wide and applies to the next person or organisation receiving the product or service.

Evidence guide

Assessment context

This unit should be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the supervision and maintenance of the application of quality procedures or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by an assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities.

Unit MEM 15.15A A Examine trading practices

Band – Specialisation band A

Field – Quality

Unit Weight 5

Notes - This unit has dual status and is to be regarded as both a Specialisation band A unit and Specialisation band B unit for progression to C5 (AQF level V)

Pre-requisite units - Path 1

12.1A Use comparison and basic measuring devices

16.2A Participate in formal interviews and negotiations

Pre-requisite units - Path 2

2.5C11 Measure with graduated devices

16.4A Perform internal/external customer service

Element 15.15A.1 Explain the requirements of Trade Measurement legislation relating to trading practices

Criteria 15.15A.1.1

Legislation requirements that apply to trading practices are explained.

Assessor guide: observe that –

Relevant sections of the legislation relating to trading practices are identified and explained.

Assessor guide: confirm that –

The term “trading practices” is defined. Relevant sections of legislation across a range of trading environments can be applied. The range of trading environments is understood and can be described.

Criteria 15.15A.1.2

Policy guidelines that apply to trading practices are explained.

Assessor guide: observe that –

Relevant organisational policy and procedures can be identified and applied in regard to trading practices.

Assessor guide: confirm that –

Relevant policy and procedures across a range of trading environments can be applied.

Element 15.15A.2 Inspect trading practices for compliance

Criteria 15.15A.2.1

Trading practice methods employed on premises are examined for compliance with legislative requirements

Assessor guide: observe that –

Methods utilised for advertising and the sale of goods employed on the premises are examined for compliance with legislative requirements The manner in which a measuring instrument is used on the premises is examined for compliance

Assessor guide: confirm that –

Trading practices relevant to a range of business types are identified

Criteria 15.15A.2.2

Incidents of non-compliance are identified and, where appropriate, activities are undertaken to prove the breach of legislation

Assessor guide: observe that –

Incidents of non-compliance in a range of trading environments can be identified Action to be undertaken is determined by the organisation's enforcement policy Sufficient and relevant evidence is gathered to prove a breach

Assessor guide: confirm that –

Processes for evidence collection are explained
Processes for evidence handling are explained

Criteria 15.15A.2.3

Results of inspection are documented

Assessor guide: observe that –

All results of the inspection are recorded accurately

Assessor guide: confirm that –

Any specific reporting procedures can be identified and explained

Element 15.15A.3 Finalise inspection and take appropriate action**Criteria 15.15A.3.1**

Trading practice information relevant to the inspection is communicated to the trader

Assessor guide: observe that –

The trader is advised of the results of the inspection The trader's enquiries and concerns are discussed Legislative requirements and obligations are explained to the trader where appropriate The trader is advised of reporting procedures and possible outcomes for any breaches detected The trader is provided with relevant information brochures

Assessor guide: confirm that –

The trader's concerns are responded to satisfactorily
The trader has been given relevant advice

Criteria 15.15A.3.2

Determine and apply approved procedures to remedy non-compliance

Assessor guide: observe that –

Notices are completed in accordance with organisational guidelines Follow-up activities are planned as required

Assessor guide: confirm that –

Wording of notices issued is accurate Legislative requirements and obligations for the issuing of notices are understood Organisation's policy guidelines for return visits are understood and can be explained

Criteria 15.15A.3.3

Complete inspection documentation in accordance with organisational procedures

Assessor guide: observe that –

All results of the inspection are recorded accurately in the organisation's information files All breach reports are completed in accordance with organisational guidelines Recommendations are clear and accurate

Assessor guide: confirm that –

Any specific reporting procedures can be identified and explained

Range statement

The range of variables provides information about the context in which the unit of competency is carried out. It allows for differences between States and Territories and the Commonwealth and between organisations and workplaces. It allows for different work requirements, work practices, and knowledge. The range of variables also provides a focus for assessment and relates to the unit as a whole.

Range Name	Description
Legislation and policies	Enabling legislation, organisational procedures and policies, workplace, health & safety, enforcement policies
Trading practices	Methods of sale of goods, advertising, use of measuring instrument, position of measuring instruments, misrepresentations, environmental factors, suitability of instrument, over pricing, incorrect measurement
Activities used to prove a breach of legislation	Trial purchases, observation/surveillance, photographs, seizure of documentations, articles, measuring instruments, testing the measuring instruments
Marketplace intelligence	Complaints, other state jurisdiction, organisational directives, product history, trader history, individual's observation

Evidence guide

Assessment context

This unit may be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge. Assessment is to be conducted over time across a range of workplace scenarios; continuous learning/assessment (re-qualification) is required.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the conduct of routine field inspections, inspecting pre-packed articles, investigating consumer complaints, using and maintaining equipment and standards, performing verification/certification or in-service inspection and the safety, quality, communication, materials handling, recording and reporting associated with examining trading practices, or other units requiring the exercise of the skills and knowledge covered by this unit.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted trade measurement techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Competency in this unit cannot be claimed until all prerequisites have been satisfied.

The unit requires integrated demonstration of all elements and their related performance criteria. Compliance with inspection procedures, audit procedures, test procedures and legislative requirements.

Assessment to be conducted over time across a range of workplace scenarios; continuous learning/assessment (re-qualification) required.

Unit MEM 15.16A A Inspect pre-packed articles

Band – Specialisation band A

Field – Quality

Unit Weight 8

Notes - This unit has dual status and is to be regarded as both a Specialisation band A unit and Specialisation band B unit for progression to C5 (AQF level V)

Pre-requisite units - Path 1

12.1A Use comparison and basic measuring devices

16.2A Participate in formal interviews and negotiations

Pre-requisite units - Path 2

2.5C11 Measure with graduated devices

16.2A Participate in formal interviews and negotiations

Element 15.16A.1 Explain the requirements of Trade Measurement legislation relating to pre-packed articles

Criteria 15.16A.1.1

Legislative requirements that apply to pre-packed articles are explained.

Assessor guide: observe that –

Relevant sections of the legislation relating to pre-packed articles can be identified and explained. Procedures for measurement determination are adhered to.

Assessor guide: confirm that –

The term “pre-packed articles” is defined. Relevant sections of legislation across a range of pre-packed articles can be applied. The range of packing types can be described.

Criteria 15.16A.1.2

Approved markings as they apply to all pre-packed articles offered for sale are described.

Assessor guide: observe that –

Assessor guide: confirm that –

Quantity statement or measurement marking form, size and position are explained. Pre-packed articles exempted from the requirements of legislation are outlined.

Element 15.16A.2 Inspect pre-packed articles for compliance with marking requirements

Criteria 15.16A.2.1

Pre-packed articles are examined for the marking of quantity statements and unit pricing in accordance with legislative requirements.

Assessor guide: observe that –

Quantity and unit pricing statements, size, position and form are assessed correctly for compliance with legislation.

Assessor guide: confirm that –

All symbols for units of measurement can be described accurately. Qualifying statements are used appropriately.

Criteria 15.16A.2.2

Pre-packed articles are examined for the marking of packer identification.

Assessor guide: observe that –

Marking of packer identification, size, position and form are compared correctly against legislation.

Assessor guide: confirm that –

Pre-packed articles exempted from the requirements of packer identification are outlined.

Criteria 15.16A.2.3

Results of examination are documented for further action.

Assessor guide: observe that –

Any marking non-compliance is recorded accurately for further action when finalising the inspection.

Assessor guide: confirm that –

Sufficient details are obtained to identify the article when it has been packed elsewhere.

Element 15.16A.3 Measure pre-packed articles**Criteria 15.16A.3.1**

Articles are selected for check-measuring in accordance with marketplace intelligence, legislative requirements and organisational procedures.

Assessor guide: observe that –

Articles to be check-measured are selected in accordance with organisational guidelines.

Assessor guide: confirm that –

Marketplace intelligence, legislative requirements and organisational procedures are used in relation to selecting pre-packed articles. The impact of environmental factors on pre-packed articles can be explained.

Criteria 15.16A.3.2

Product handling and disposal requirements are assessed and complied with in accordance with Workplace, Health and Safety requirements, environmental considerations and public sector auditor's requirements.

Assessor guide: observe that –

Products are handled in a safe manner. Disposal of products is completed in a safe manner. Consideration is given to any impact on the environment. Articles seized or purchased with public monies, are disposed of in accordance with auditor's instructions or organisational guidelines.

Assessor guide: confirm that –

Use of protective clothing and equipment is identified and understood. Checking of hazardous product data sheet can be undertaken.

Criteria 15.16A.3.3

Specialised equipment and measuring devices are selected in accordance with organisational procedures.

Assessor guide: observe that –

The most appropriate equipment and measuring devices are selected for the measurement of the pre-packed articles.

Assessor guide: confirm that –

The organisation's policy and procedures can be understood and explained. The accuracy and suitability of the measuring devices used to check pre-packed articles can be described.

Criteria 15.16A.3.4

Articles are check-measured in accordance with organisation's procedures to determine compliance with legislation.

Assessor guide: observe that –

The most appropriate methods for determining the measurement of pre-packed articles are used. The number of articles to check-measure are selected in accordance with legislative requirements.

Assessor guide: confirm that –

Procedures for determining the measurement method of pre-packed articles are used in accordance with organisational guidelines and best practice.

Criteria 15.16A.3.5

Results of check-measurements are documented for further action.

Assessor guide: observe that –

The check-measurement results are documented in accordance with organisational guidelines. Measurement non-compliance is recorded for further action.

Assessor guide: confirm that –

Sufficient details of the article are obtained, including samples where appropriate. Methods of determining the tare weight of packages can be described.

Element 15.16A.4 Finalise inspection and take appropriate action**Criteria 15.16A.4.1**

Trading practice information relevant to the inspection is communicated to the trader.

Assessor guide: observe that –

The trader is advised of the results of the inspection. The trader's enquiries and concerns are discussed. Legislative requirements and obligations are explained to the trader where appropriate. The trader is advised of reporting procedures and possible outcomes for any breaches detected. The trader is provided with relevant information brochures.

Assessor guide: confirm that –

The trader's concerns are responded to satisfactorily. The trader has been given relevant advice.

Criteria 15.16A.4.2

Determine and apply approved procedures to remedy non-compliance.

Assessor guide: observe that –

Notices are completed in accordance with organisational guidelines. Follow-up activities are planned as required.

Assessor guide: confirm that –

Wording of notices issued is accurate. Legislative requirements and obligations for the issuing of notices are understood. Organisation's guidelines for return visits are understood and can be explained.

Criteria 15.16A.4.3

Complete inspection documentation in accordance with organisational procedures.

Assessor guide: observe that –

Results of the inspection are recorded accurately in organisation's information files. Breach reports are completed in accordance with organisational guidelines. Recommendations are clear and accurate.

Assessor guide: confirm that –

Any specific reporting procedures can be identified and explained.

Range statement

The range of variables provides information about the context in which the unit of competency is carried out. It allows for differences between States and Territories and the Commonwealth and between organisations and workplaces. It allows for different work requirements, work practices, and knowledge. The range of variables also provides a focus for assessment and relates to the unit as a whole.

Range Name	Description
Legislation and policies	Enabling legislation, organisational policies and procedures, workplace, health and safety, environmental legislation, enforcement policies, auditor's instructions
Marketplace intelligence	Complaints, other state jurisdiction, organisational directives, product history, trader history, individual's observation
Specialist equipment	Reference standards and test equipment, safety equipment, product handling equipment, measuring equipment
Incorrect packages	Incorrect measurement, over pricing, incorrect marking of packages
Documentation	Organisational forms, notices, field books, product handling sheets, evaluation form or report
Workplace, health & safety considerations	Storage of test equipment, site/premise conditions, handling of dangerous materials, safety clothing, manual handling techniques, product disposal, transportation of test equipment
Reference material	International handbook, Australian standards, organisational policies and procedures, AQS guidelines
Environmental considerations	Disposal of hazardous materials, weather conditions, storage methods and conditions

Evidence guide

Assessment context

This unit may be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge. Assessment is to be conducted over time across a range of workplace scenarios; continuous learning/assessment (re-qualification) required

Critical aspects

This unit could be assessed in conjunction with any other units addressing the conduct of routine field inspections, examining trading practices, investigating consumer complaints, using and maintaining equipment and standards, performing verification/certification or in-service inspection and the safety, quality, communication, materials handling, recording and reporting associated with inspecting pre-packed articles, or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

The unit requires integrated demonstration of all elements and their related performance criteria. Compliance with inspection procedures, audit procedures, test procedures and legislative requirements is required. Assessment to be conducted over time across a range of workplace scenarios; continuous learning/assessment (re-qualification) is required.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted trade measurement techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 15.17B A Use and maintain reference standards

Band – Specialisation band B

Field – Quality

Unit Weight 3

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices

12.4A Precision electrical/electronic measurement

18.2A Use power tools/hand held operations

11.11A Manual handling

12.5B Calibrating measuring equipment

12.3A Precision mechanical measurement

18.1A Use hand tools

Element 15.17B.1 Identify the appropriate class of reference standard suitable to verify a range of trade measuring instruments

Criteria 15.17B.1.1

Tolerances required for reference standards are researched in relation to testing a range of trade measuring instruments.

Assessor guide: observe that –

Correct reference manuals are accessed to gain appropriate information concerning tolerances for reference standards.

Assessor guide: confirm that –

Legal metrology is defined. The hierarchy of reference standards in relation to legal metrology is explained. Australian legal units of measurement used for trade are described. The organisations involved in legal metrology in Australia can be identified.

Criteria 15.17B.1.2

The correct classes of reference standards are selected to test a range of trade measuring instruments.

Assessor guide: observe that –

Correct class of reference standard is identified and matched with the appropriate trade measuring instrument.

Assessor guide: confirm that –

Application of different classes of reference standards used to test measuring instruments is explained.

Element 15.17B.2 Use reference standards and test equipment in a safe and metrologically sound manner

Criteria 15.17B.2.1

Standards Laboratory purpose and function are explained.

Assessor guide: observe that –

Assessor guide: confirm that –

Major function and purpose of the Standards Laboratory can be outlined.

Criteria 15.17B.2.2

An operational assessment on reference standards and test equipment is performed prior to use.

Assessor guide: observe that –

Operational assessment on reference standards and test equipment is completed in accordance with organisational procedures.

Assessor guide: confirm that –

The actions to be taken if reference standards and test equipment are found to be defective can be described.

Criteria 15.17B.2.3

Documented operating procedures for reference standards and test equipment are accessed and followed.

Assessor guide: observe that –

Documented operating procedures for reference standards and test equipment are accessed. Reference standards and test equipment is operated correctly during instrument tests.

Assessor guide: confirm that –

The actions to be taken if reference standards and test equipment are found to be defective can be described.

Criteria 15.17B.2.4

Safety requirements for the use of reference standards and test equipment within the work environment are demonstrated.

Assessor guide: observe that –

Workplace, health and safety requirements relating to reference standards and test equipment are identified and followed.

Assessor guide: confirm that –

Personal responsibility for workplace, health and safety requirements can be described.

Element 15.17B.3 Store and transport reference standards and test equipment to maintain their integrity**Criteria 15.17B.3.1**

Specialised equipment and reference standards are stored in accordance with organisational procedures.

Assessor guide: observe that –

Test equipment and reference standards storage specifications and procedures are researched prior to storage. Storage specification and procedures are followed.

Assessor guide: confirm that –

Variations from storage specifications and procedures requiring appropriate approval can be explained.

Criteria 15.17B.3.2

Specialised equipment and reference standards are transported in accordance with organisational procedures.

Assessor guide: observe that –

Specialised equipment, reference standards and transport specifications and procedures are researched prior to transportation. Transport specifications and procedures are followed.

Assessor guide: confirm that –

Variations from transport specifications and procedures requiring appropriate approval can be explained.

Element 15.17B.4 Perform required maintenance of reference standards and test equipment**Criteria 15.17B.4.1**

Maintenance requirements of reference standards and test equipment are identified.

Assessor guide: observe that –

Maintenance requirements for reference standards and test equipment are researched.

Assessor guide: confirm that –

Maintenance required for test equipment where manufacturer's requirements are unavailable, can be explained.

Criteria 15.17B.4.2

Regular maintenance of reference standards and test equipment is undertaken in accordance with maintenance register.

Assessor guide: observe that –

Minor calibration/maintenance is completed according to manufacturer's specification. Maintenance register is maintained as required.

Assessor guide: confirm that –

A range of maintenance and calibration procedures can be described.

Criteria 15.17B.4.3

Defective reference standards and test equipment are identified and reported for repair.

Assessor guide: observe that –

Malfunction of or damage to reference standards or test equipment is identified and reported for repair.

Assessor guide: confirm that –

Procedure for reporting faults can be outlined.

Element 15.17B.5 Interpret documentation relating to the use of maintenance of reference standards and test equipment**Criteria 15.17B.5.1**

Information contained in the Certificate of Verification is checked and compared with reference standards and test equipment being used.

Assessor guide: observe that –

The class of a reference standard and its duration of validity are identified from a Certificate of Verification. Certificate documentation is used to prove legal traceability.

Assessor guide: confirm that –

Action to be taken where legal traceability can not be confirmed, can be described. The purpose of Certificates of Verification issued under the national legislation is explained.

Criteria 15.17B.5.2

Reference standards are used in accordance with documented instructions and certificates.

Assessor guide: observe that –

The interpretation of Certificates of Verification in relation to the use of reference standards is applied.

Assessor guide: confirm that –

Graphs and tables within Certificates are understood and can be used accurately.

Range statement

The range of variables provides information about the context in which the unit of competency is carried out. It allows for differences between States and Territories and the Commonwealth and between organisations and workplaces. It allows for different work requirements, work practices, and knowledge. The range of variables also provides a focus for assessment and relates to the unit as a whole.

Range Name	Description
Legislation and policies	Enabling legislation, organisational policies and procedures, workplace, health and safety, environmental legislation
Reference material	Australian standards, verifying authorities handbook, manufacturers operating manuals, organisational procedures, quality assured manual
Specialists equipment	Reference standards, measuring devices, safety equipment
Operating procedures	Manufacturers specifications, industry guidelines, Australian Standards, legislation, organisational procedures and guidelines
Reference standards	Mass, volume, density, area, length, master meters, temperature
Maintenance of test equipment and reference standards	Cleaning and painting, electrical safety testing and tagging, continuity and pressure testing, manufacturers service requirements
Workplace Health & Safety Considerations	Storage and transportation of test equipment, handling of test equipment, handling of hazardous materials, safety clothing, manual handling techniques, site/premises conditions

Evidence guide

Assessment context

This unit may be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge. Assessment is to be conducted over time across a range of workplace scenarios; continuous learning/assessment (re-qualification) required

Critical aspects

This unit could be assessed in conjunction with any other units addressing the skills and knowledge covered by this unit.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe

Competency in this unit cannot be claimed until all prerequisites have been satisfied.

accordance with standard operating procedures; - perform all tasks to specification; - use

The unit requires integrated demonstration of all elements and their related performance criteria. Compliance with inspection procedures, audit procedures, test procedures and legislative requirements.

Assessment to be conducted over time across a range of workplace scenarios; continuous learning/assessment (re-qualification) is required.

and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in

accepted trade measurement techniques, practices, processes and workplace procedures.

Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 15.18B A Investigate consumer complaints

Band – Specialisation band B

Field – Quality

Unit Weight 6

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices

12.4A Precision electrical/electronic measurement

15.5A Perform inspection (advanced)

15.17B Use and maintain reference standards

18.1A Use hand tools

11.11A Manual handling

12.5B Calibrating measuring equipment

15.15A Examine trading practices

16.2A Participate in formal interviews and negotiations

18.2A Use power tools/hand held operations

12.3A Precision mechanical measurement

15.4A Perform inspection (basic)

15.16A Inspect pre-packed articles

16.4A Perform internal/external customer service

Element 15.18B.1 Receive and document the complaint

Criteria 15.18B.1.1

Allegations are recorded in accordance with organisational procedures.

Assessor guide: observe that –

All relevant information is sought from complainant. Complaint details are recorded accurately. Interpersonal communication and listening skills are used while communicating with the complainant.

Assessor guide: confirm that –

The different methods of complaint lodgements can be described.

Criteria 15.18B.1.2

Complaints are screened to ensure that they are relevant to trade measurement and are assessed to determine priority.

Assessor guide: observe that –

Complaint information is assessed for its relevance to trade measurement. Allocation of priority and planning of a number of complaints and other work activities is undertaken.

Assessor guide: confirm that –

Organisational policy guidelines concerning complaints can be explained.

Criteria 15.18B.1.3

Complainant is advised of investigative process and timeframes for feedback.

Assessor guide: observe that –

Information is given to complainant in regards to the investigative process and appropriate timelines for feedback.

Assessor guide: confirm that –

Organisational guidelines in regard to timelines are described.

Element 15.18B.2 Plan the investigation**Criteria 15.18B.2.1**

The information received is assessed for possible breaches in relation to the legislation.

Assessor guide: observe that –

Potential breaches are identified from available information.

Assessor guide: confirm that –

Relevant legislation can be researched and applied to the complaint investigation.

Criteria 15.18B.2.2

Trader history and complaint precedence is researched.

Assessor guide: observe that –

Organisational information systems are accessed and relevant information obtained.

Assessor guide: confirm that –

The organisation's information database can be accessed to research complaint precedence.

Criteria 15.18B.2.3

Suitable equipment and personnel are organised to undertake the investigation.

Assessor guide: observe that –

Suitable equipment and personnel are determined and organised. Personnel are briefed concerning the requirements of the investigation.

Assessor guide: confirm that –

The equipment required to investigate a range of complaints is described. The organisation's guidelines for the deployment of personnel are explained.

Criteria 15.18B.2.4

Enforcement policies and procedures are researched to ascertain appropriate action to be implemented.

Assessor guide: observe that –

The organisation's enforcement policies and procedures are accessed and appropriate course of action is established.

Assessor guide: confirm that –

The range of possible investigation activities available can be described.

Element 15.18B.3 Investigate the complaint**Criteria 15.18B.3.1**

Preliminary investigation to gather prima facie evidence is conducted in accordance with organisational procedures.

Assessor guide: observe that –

Surveillance of trading premises is conducted. Information is gathered to verify the complainant's allegations.

Assessor guide: confirm that –

Elements of offence can be identified. Available surveillance methods for a range of complaints and premises can be explained.

Criteria 15.18B.3.2

Evidence is gathered to substantiate a breach in accordance with investigative practices.

Assessor guide: observe that –

Evidence is gathered to prove all elements of a breach. Appropriate investigative techniques are used. The integrity of evidence is maintained.

Assessor guide: confirm that –

The evidence required to prove a range of breaches of legislation can be described. A range of investigation methods is outlined. The required procedures for the handling of evidence to maintain its integrity can be explained.

Criteria 15.18B.3.3

The relevant components of a routine field inspection are conducted in accordance with organisational procedures.

Assessor guide: observe that –

All appropriate aspects of a routine field inspection are undertaken.

Assessor guide: confirm that –

The reasons for selecting relevant components of a routine field inspection are understood.

Element 15.18B.4 Finalise the complaint investigation**Criteria 15.18B.4.1**

Information relevant to the inspection is communicated to the trader.

Assessor guide: observe that –

The trader is advised of the results of the inspection. The trader's enquiries and concerns are discussed. Legislative requirements and obligations are explained to the trader where appropriate. The trader is advised of reporting procedures and possible outcomes for any breaches detected. The trader is provided with relevant information brochures.

Assessor guide: confirm that –

Traders' concerns are responded to satisfactorily.

Criteria 15.18B.4.2

Determine and apply approved procedures to remedy non-compliance.

Assessor guide: observe that –

Notices are completed in accordance with organisational guidelines. Follow-up activities are planned as required.

Assessor guide: confirm that –

Wording of notices issued is accurate. Legislative requirements and obligations for the issuing of notices can be explained. Organisation's policy guidelines for return visits can be explained.

Criteria 15.18B.4.3

Complete inspection documentation in accordance with organisational procedures.

Assessor guide: observe that –

All results of the inspection are recorded accurately in organisation's information files. Breach reports are completed in accordance with organisational guidelines
Recommendations are clear and accurate.

Assessor guide: confirm that –

Specific reporting procedures can be identified and explained.

Element 15.18B.5 Complete complaint file documentation**Criteria 15.18B.5.1**

Complainant is advised of outcome of the investigation.

Assessor guide: observe that –

Outcomes of the investigation are communicated to the complainant within specified organisational timeframes.
Interpersonal communication and listening skills are used while communicating with the complainant.

Assessor guide: confirm that –

Complaint outcome classifications are correctly used and understood.

Criteria 15.18B.5.2

Complaint documentation is completed in accordance with organisational guidelines.

Assessor guide: observe that –

All activities including the results of the investigation are recorded accurately in the complaint file.

Assessor guide: confirm that –

Complaint documentation procedures can be explained.
Specific reporting procedures can be explained.

Range statement

The range of variables provides information about the context in which the unit of competency is carried out. It allows for differences between States and Territories and the Commonwealth and between organisations and workplaces. It allows for different work requirements, work practices, and knowledge. The range of variables also provides a focus for assessment and relates to the unit as a whole.

Range Name	Description
Legislation and policies	Enabling legislation, organisational policies and procedures, workplace, health and safety, environmental legislation, enforcement policies
Documentation	Organisational forms, notices, field books, product handling sheets, educational material/brochures
Reference material	Uniform test procedures, International handbook, Australian standards, Investigation method guidelines
Environmental considerations	Disposal of hazardous materials, weather conditions, storage methods and conditions
Complaints may include reference to:	Measuring instruments, pre-packed articles, trading practices, servicing licensees, public weighbridge licensees, fair trading matters relating to trade measurement
Organisational procedures covering preliminary investigation	Trial purchase, surveillance, witness statements, verification/in-service inspection procedures, pre-packed articles inspection procedures, trading practices inspection procedures, routine field inspection procedures
Sources of information	Business/company details, organisational database, searches from other government agencies
Specialists equipment	Reference standards, test equipment, safety equipment
Workplace, Health and Safety Considerations	Storage and transportation of test equipment, site/premises conditions, disposal of dangerous materials, storage of seized equipment/products, specific safety equipment and clothing, manual handling techniques, product handling equipment

Evidence guide

Assessment context

This unit may be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge. Assessment is to be conducted over time across a range of workplace scenarios; continuous learning/assessment (re-qualification) required

Critical aspects

This unit could be assessed in conjunction with any other units addressing the conduct of routine field inspections, examining trading practices, inspecting pre-packed articles, using and maintaining equipment and standards, performing verification/certification or in-service inspection and the safety, quality, communication, materials handling, recording and reporting associated with investigating consumer complaints, or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

The unit requires integrated demonstration of all elements and their related performance criteria. Compliance with inspection procedures, audit procedures, test procedures and legislative requirements. Assessment to be conducted over time across a range of workplace scenarios; continuous learning/assessment (re-qualification) is required.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted trade measurement techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 15.19B A Conduct a field inspection

Band – Specialisation band B

Field – Quality

Unit Weight 12

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices
 11.11A Manual handling
 12.5B Calibrating measuring equipment
 15.5A Perform inspection (advanced)
 15.17B Use and maintain reference standards
 16.4A Perform internal/external customer service

9.1A Draw and interpret sketch
 12.3A Precision mechanical measurement
 13.3A Work safely with industrial chemicals and materials
 15.15A Examine trading practices
 15.18B Investigate consumer complaints
 18.1A Use hand tools

9.2A Interpret technical drawing
 12.4A Precision electrical/electronic measurement
 15.4A Perform inspection (basic)
 15.16A Inspect pre-packed articles
 16.2A Participate in formal interviews and negotiations
 18.2A Use power tools/hand held operations

Element 15.19B.1 Develop a work plan to conduct field inspections

Criteria 15.19B.1.1

Traders are identified for inspection in accordance with organisational priorities.

Assessor guide: observe that –

The organisation's information system is accessed correctly and interrogated for relevant trader information. Information is collected in accordance with the organisation's inspection priorities. Trading environments and instruments to be tested are identified and selected.

Assessor guide: confirm that –

The organisation's inspection priorities are understood and applied.

Criteria 15.19B.1.2

Routine field inspections are scheduled to compliment other inspection activities whilst maximising organisational efficiencies and effectiveness.

Assessor guide: observe that –

Appropriate strategies are used to schedule inspection activities. Identification of priorities and their integration into routine field inspections are undertaken.

Assessor guide: confirm that –

A range of options can be developed for dealing with conflicting priorities.

Criteria 15.19B.1.3

Appropriate equipment is identified and accessed.

Assessor guide: observe that –

Equipment required to undertake scheduled work activities identified. The test equipment is accessed correctly.

Assessor guide: confirm that –

A range of equipment used for various tasks can be identified.

Criteria 15.19B.1.4

Specific inspection arrangements are made with the trader.

Assessor guide: observe that –

Arrangements for the provision of test equipment are negotiated with the trader. Awareness of the operational needs of the trader is demonstrated.

Assessor guide: confirm that –

Arrangements are made only when necessary. Alternative contact arrangements are explained.

Criteria 15.19B.1.5

Relevant reference and/or technical information and trader history is researched.

Assessor guide: observe that –

The criteria for selection of instruments for test such as previous individual instrument history, environmental factors, and performance problems of various models of instruments are used.

Assessor guide: confirm that –

A range of environmental factors that impinge on measuring instruments is explained.

Element 15.19B.2 Maintain test equipment during a field inspection**Criteria 15.19B.2.1**

Test equipment is transported in accordance with manufacturer's specifications and organisational procedures.

Assessor guide: observe that –

Test equipment transportation specifications and procedures are accessed and complied with prior to transportation.

Assessor guide: confirm that –

Variations from transport specifications and procedures requiring appropriate approval can be explained.

Criteria 15.19B.2.2

Test equipment is operated within manufacturers' specifications and organisational procedures.

Assessor guide: observe that –

Test equipment operating specifications and procedures are accessed and complied with.

Assessor guide: confirm that –

Variations from operating specifications and procedures requiring appropriate approval can be explained.

Criteria 15.19B.2.3

Failures and repairs of test equipment are reported in accordance with organisational procedures.

Assessor guide: observe that –

Minor calibration/repairs are completed according to manufacturer's specifications. Faults are recognised and reported in accordance with organisational procedures.

Assessor guide: confirm that –

Types of failure that might occur and possible remedies in a range of test equipment are described. Preventative work practices to maintain equipment in good working order is described. Preventative maintenance of equipment is described.

Element 15.19B.3 Conduct initial on-site assessment of the trading premises

Criteria 15.19B.3.1

Surveillance of the trading premises is undertaken to evaluate the trading practices in use.

Assessor guide: observe that –

Surveillance of trading premises is conducted Information gathered during surveillance is evaluated accurately to identify non-compliance.

Assessor guide: confirm that –

Methods of surveillance that can be undertaken are described.

Criteria 15.19B.3.2

Officer establishes their identity with the trader or responsible person and explains the purpose of the inspection.

Assessor guide: observe that –

The organisation's identification procedure is used (e.g., ID card). The purpose of the inspection is explained and clarified with the trader.

Assessor guide: confirm that –

Legislative requirements for the inspection are explained.

Criteria 15.19B.3.3

Local workplace, health and safety issues relevant to the premises are identified and appropriate action is taken to comply.

Assessor guide: observe that –

Workplace, health and safety information specific to the trading environment is obtained from the trader. All specific workplace, health and safety requirements are complied with.

Assessor guide: confirm that –

Personal responsibility for workplace, health and safety is understood. Workplace, health and safety issues relating to a range of occupational and business environments can be identified.

Criteria 15.19B.3.4

Measuring instruments used for trade are identified and the inspection planned with minimal disruption to the trader.

Assessor guide: observe that –

Considerations concerning the operational efficiency of the trader are made in determining the inspection strategy.

Assessor guide: confirm that –

Operational efficiency of the trader does not compromise the inspection effectiveness. A range of contingencies can be developed to facilitate minimal disruption to the trader.

Criteria 15.19B.3.5

Locations for product return or disposal are identified for later use.

Assessor guide: observe that –

Advice is sought from the trader concerning the method of product return/disposal. Inspection and confirmation of the correct return/disposal point are undertaken.

Assessor guide: confirm that –

Action that would be taken if incorrect disposal occurs can be described.

Element 15.19B.4 Inspect instruments and/or trading practices

Criteria 15.19B.4.1

Measuring instruments are selected for inspection in accordance with organisational guidelines.

Assessor guide: observe that –

Organisational information system is interrogated accurately for individual instrument history at trader's premises. Performance trends of particular models of instruments are considered.

Assessor guide: confirm that –

The organisation's information system can be used to access information such as certification and inspection records. Research methods used to determine instrument performance trends are described.

Criteria 15.19B.4.2

Test equipment is used in accordance with organisational procedures taking into consideration workplace health and safety factors.

Assessor guide: observe that –

Organisational procedures are complied with in the use of test equipment. All relevant workplace, health and safety requirements are implemented.

Assessor guide: confirm that –

Workplace, health and safety requirements can be described for a range of test procedures and working environments.

Criteria 15.19B.4.3

Relevant test procedures for verification and in-service inspection are conducted in accordance with organisational procedures.

Assessor guide: observe that –

Relevant test procedures are followed. Data plate information and instrument errors are recorded in accordance with organisation's procedures. Environmental and operational factors adversely influencing the accuracy of instruments are identified and action taken to remedy their effect.

Assessor guide: confirm that –

A range of environmental and operational factors that may adversely influence the accuracy of instruments and action required to remedy their effect can be identified.

Criteria 15.19B.4.4

Inspection of pre-packed articles is conducted in accordance with organisational procedures.

Assessor guide: observe that –

Pre-packed articles are identified for inspection. Packaging information and check-measurement results are recorded in accordance with organisation's guidelines. Incorrect packages are identified and action taken to remedy their non-compliance.

Assessor guide: confirm that –

Pre-packed articles legislation can be applied across a range of trading environments. Organisational guidelines for the selection of pre-packed articles for inspection can be explained.

Criteria 15.19B.4.5

Trading practices are identified and action taken to remedy any non-compliance.

Assessor guide: observe that –

Sales transactions conducted on the premises are monitored. Advertising used on or outside the premises is assessed. Incorrect trading practices are identified and action taken to remedy non-compliance.

Assessor guide: confirm that –

A range of non-compliance issues for trading practices can be described.

Element 15.19B.5 Undertake an investigation where a breach is detected**Criteria 15.19B.5.1**

Evidence relating to the breach is gathered.

Assessor guide: observe that –

Sufficient evidence can be gathered to prove a breach. All elements of an offence are considered and proved.

Assessor guide: confirm that –

Strategies used to prove breaches of trading practices including trial purchases, can be described.

Criteria 15.19B.5.2

Trader and witnesses are interviewed for supporting evidence.

Assessor guide: observe that –

Interview questions are prepared in a logical manner to cover all elements of an offence. Appropriate recording methods are used during the interviews and the taking of statements. Assertive communication and active listening skills are used to maintain control of the interview. Strategies for managing and reducing conflict are used. Awareness of cultural and gender issues are demonstrated.

Assessor guide: confirm that –

The format and procedure for conducting an interview in accordance with organisational guidelines can be explained. The principles of natural justice, requirements of appropriate legislation, judges or court rules, the organisation's code of conduct are understood and applied. Assertive communication and active listening skills can be applied in a range of interviewing situations. Strategies for handling conflict can be described. Sensitivity to cultural and gender issues that influence the communication/interviewing process is explained.

Criteria 15.19B.5.3

Chain of evidence is maintained.

Assessor guide: observe that –

Evidence can be identified/labelled and/or secured as required by organisational procedures. Possession of the evidence is monitored to maintain its integrity.

Assessor guide: confirm that –

Maintenance of evidence integrity can be explained. Recording and secure storage of evidence in accordance with organisational procedures can be explained.

Element 15.19B.6 Complete documentation for inspection**Criteria 15.19B.6.1**

Instrument and trader information is recorded accurately for the organisation's information system.

Assessor guide: observe that –

Ownership details and instrument information is recorded accurately.

Assessor guide: confirm that –

Types of ownership entities for legal responsibilities can be described.

Criteria 15.19B.6.2

Inspection documentation is completed in accordance with organisational procedures.

Assessor guide: observe that –

All inspection data is recorded accurately, clearly and concisely. Recording of information is consistent with organisational procedures.

Assessor guide: confirm that –

Appropriate forms can be identified and used for inspection outcomes including non-compliance and rejection notices, instrument performance records, fees and trader's files.

Element 15.19B.7 Advise trader of inspection outcomes**Criteria 15.19B.7.1**

The trader is advised of instrument test, pre-packed article and trading practice results where appropriate.

Assessor guide: observe that –

Relevant information is communicated to the trader. Information is provided in a timely manner. Assertive communication and active listening skills are used to explain information to the trader. Strategies for managing and reducing conflict are used. Awareness of cultural and gender issues are demonstrated.

Assessor guide: confirm that –

Suitable environment to communicate inspection outcomes with trader can be identified. Assertive communication and active listening skills can be applied in a range of trader environments. Strategies for handling conflict situations can be described. Sensitivity to cultural and gender issues that influence the communication process is explained.

Criteria 15.19B.7.2

The trader's enquiries and concerns are discussed.

Assessor guide: observe that –

Accurate product knowledge is presented to the trader. Questions requiring clarification are researched for further advice to the trader. Assertive communication and active listening skills are used to explain information to the trader. Strategies for managing and reducing conflict are used. Awareness of cultural and gender issues are demonstrated.

Assessor guide: confirm that –

Verbal and non-verbal communication strategies can be identified to ensure comprehension of information being discussed.

Criteria 15.19B.7.3

Legislative requirements, obligations and possible corrective solutions are explained to the trader where appropriate.

Assessor guide: observe that –

Discussion of information between the trader and inspector is clear and accurate.

Assessor guide: confirm that –

Corrective solutions for a range of scenarios can be identified. Legislative requirements for a range of trading environments are explained.

Criteria 15.19B.7.4

The trader is advised of reporting procedures and possible outcomes for any detected breaches.

Assessor guide: observe that –

Discussion of reporting procedures and outcome options in relation to detected breaches is clear and accurate.

Assessor guide: confirm that –

Reporting processes and outcomes can be outlined in accordance with organisational procedures. Accurate interpretation of enforcement guidelines can be explained.

Criteria 15.19B.7.5

Plan follow-up activities if required.

Assessor guide: observe that –

The need for follow-up activities is identified Follow-up activities are planned.

Assessor guide: confirm that –

Methods for conducting a follow-up activity can be explained.

Range statement

The range of variables provides information about the context in which the unit of competency is carried out. It allows for differences between States and Territories and the Commonwealth and between organisations and workplaces. It allows for different work requirements, work practices, and knowledge. The range of variables also provides a focus for assessment and relates to the unit as a whole.

Range Name	Description
Legislation and policies	Enabling legislation, uniform test procedures, organisational policies and procedures and policies, workplace, health and safety and enforcement policies
Specialist equipment	Specific test equipment, reference standards, safety equipment, product handling equipment
Incorrect packages	May include short measure, over pricing, incorrect marking of packages
Trading practices	May include advertising, over the counter sales, correct use of measuring instruments, method of sale of goods, positioning of instruments, environmental factors, suitability of instrument, over pricing, incorrect measurement
Documentation	May include organisational forms, notices, field books, evaluation form or report, fees, servicing licensee forms, educational material/brochures
Information systems	May include organisation's databases, business/company details
Workplace, health & safety considerations	May include storage of test equipment, site/premises conditions, disposal of dangerous materials, storage of seized equipment, specific safety equipment and clothing

Evidence guide

Assessment context

This unit may be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge. Assessment is to be conducted over time across a range of workplace scenarios; continuous learning/assessment (re-qualification) is required.

Critical aspects

This unit could be assessed in conjunction with any other units addressing examining trading practices, inspecting pre-packed articles, investigating consumer complaints, performing

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; -

verification/certification or in-service inspection, communication, materials handling, recording and reporting associated with conducting a routine field inspection, or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied. The unit requires integrated demonstration of all elements and their related performance criteria. Compliance with inspection procedures, audit procedures, test procedures and legislative requirements is required.

plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted trade measurement techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 15.20B B Perform verification/certification or in-service inspection

Band – Specialisation band B

Field – Quality

Unit Weight 12

This unit is designed for those performing trade measurement inspection/certification activities in public or private enterprises. The unit covers the competency required

to test a range of measuring instruments used for trade.

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices

11.11A Manual handling

12.5B Calibrating measuring equipment

16.2A Participate in formal interviews and negotiations

9.1A Draw and interpret sketch

12.3A Precision mechanical measurement

13.3A Work safely with industrial chemicals and materials

18.1A Use hand tools

9.2A Interpret technical drawing

12.4A Precision electrical/electronic measurement

15.17B Use and maintain reference standards

18.2A Use power tools/hand held operations

Element 15.20B.1 Describe the design and application of basic components in trade measuring instruments

Criteria 15.20B.1.1

The fundamental operating features for a range of measuring instruments are identified

Assessor guide: observe that –

Operating features of instruments are correctly identified and used

Assessor guide: confirm that –

The major components and functions of an instrument can be explained

Criteria 15.20B.1.2

The purpose of major components within the range of measuring instruments is described

Assessor guide: observe that –

Components are correctly identified and located on an instrument

Assessor guide: confirm that –

The purpose of major components and functions of an instrument can be explained

Element 15.20B.2 Determine the type of inspection required for a range of measuring instruments

Criteria 15.20B.2.1

Instrument is assessed to determine whether a verification/certification or in-service tolerance is to be applied for inspection

Assessor guide: observe that –

The instrument is examined for existing verification/certification marks

Assessor guide: confirm that –

Differences in the application of tolerances being applied are explained

Criteria 15.20B.2.2

The processes required for both the verification/certification and in-service of a range of measuring instruments are explained

Assessor guide: observe that –

Process variations between verification/ certification and in-service inspection are identified

Assessor guide: confirm that –

Process variations between verification/ certification and in-service inspection are explained

Criteria 15.20B.2.3

Appropriate tolerances are identified for the determined inspection

Assessor guide: observe that –

Appropriate tolerances are applied to the measuring instruments being inspected

Assessor guide: confirm that –

Appropriate tolerances are explained for a range of measuring instruments

Element 15.20B.3 Perform inspection of measuring instruments to determine compliance**Criteria 15.20B.3.1**

The operating environment of the instrument is analysed to determine its impact on the instrument

Assessor guide: observe that –

Environmental factors are identified for the instrument being tested

Assessor guide: confirm that –

Environmental factors that may not result in an instrument rejection but other remedial actions are identified

Criteria 15.20B.3.2

Sources of any possible operational error in the use of measuring instruments/systems are identified

Assessor guide: observe that –

Identification of operational errors relevant to the type of instrument being tested is demonstrated

Assessor guide: confirm that –

Criteria 15.20B.3.3

Specialised equipment is selected and used in the prescribed manner for the inspection

Assessor guide: observe that –

Suitable test equipment is selected and correct use of the test equipment is demonstrated

Assessor guide: confirm that –

Specialised equipment that may be required from other organisations are identified

Criteria 15.20B.3.4

Conduct inspection of measuring instrument in accordance with appropriate test procedures and workplace, health and safety guidelines

Assessor guide: observe that –

Measuring instruments are tested in accordance with the appropriate test procedures Workplace, health and safety issues are identified and appropriate action taken

Assessor guide: confirm that –

The action to be taken where a conflict occurs between uniform test procedures and those test procedures contained in Certificates of Approval can be explained

Element 15.20B.4 Finalise inspection and take appropriate action**Criteria 15.20B.4.1**

Determine and implement the appropriate action to be undertaken

Assessor guide: observe that –

Where non-compliance is identified, existing verification/certification marks are removed and appropriate notices and instructions are provided to the trader Advice for resolving detected problems is provided to the trader

Assessor guide: confirm that –

Removal of verification/certification marks is impractical on some instruments and the appropriate action to be taken in these circumstances is explained

Criteria 15.20B.4.2

Performance trends of particular models of measuring instruments are identified and reported

Assessor guide: observe that –

Performance information can be identified and a technical report prepared

Assessor guide: confirm that –

Criteria 15.20B.4.3

The information is recorded in the organisation's information system

Assessor guide: observe that –

The organisation's information files are completed

Assessor guide: confirm that –

Methods to monitor performance trends can be explained

Range statement

The range of variables provides information about the context in which the unit of competency is carried out. It allows for differences between States and Territories and the Commonwealth and between organisations and workplaces. It allows for different work requirements, work practices, and knowledge. The range of variables also provides a focus for assessment and relates to the unit as a whole. The following measuring instruments are indicative of the level, complexity and range of instruments applicable to this unit: simple measuring instruments and auxiliary devices, alcohol measuring instruments, fuel dispensers - retail, bulk flowmeters, miscellaneous measuring instruments, weighing instruments less than 100kg, high-capacity measuring instruments, vehicle tanks, milk tanks. Where work requires measuring instruments of a lower level of complexity and range, and lower scope relating to uniform test procedures, reference material etc. Unit 15.4A (perform inspection (basic)) or Unit 15.5A (Perform inspection (advanced)) should

Range Name**Description**

Legislation and policies	Enabling legislation, organisational policies and procedures, workplace, health and safety, environmental legislation, enforcement policies, conditions of licence
Monitoring	Specific test equipment, random inspections, surveillance, complaint inspection, comparison/analysis of data over time, collation of statistical information, auditing of servicing licensees
Specialist equipment	Reference standards, safety equipment, product handling equipment, test equipment, specialised test equipment vehicles
Range of measuring instruments	Length of measures and measuring instruments, area measuring instruments, measures of volume, liquor measuring instruments, liquid measuring instruments, weighing instruments, milk tanks, vehicle tanks, liquefied gas flow meters, electronic metering systems, natural gas flow meters, dimensional measuring instruments, supplementary measuring instrument, auxiliary devices
Reference material	NSC Certificates of Approval, manufacturers product specifications, Australian standards, WHS Legislation, Uniform Test Procedures, organisational procedures and guidelines, Certificates of Verification
Forms of documentation used	Non-compliance notices, reflect/incorrect notices, fees, organisational reporting forms
Workplace, Health and Safety Considerations	Storage and transportation of test equipment, site/premises conditions, specific safety equipment and clothing, manual handling techniques

Evidence guide**Assessment context**

This unit may be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge. Assessment is to be conducted over time across a range of workplace scenarios; continuous learning/assessment (re-qualification) required

Critical aspects**Special notes**

This unit could be assessed in conjunction with any other units addressing the conduct of routine field inspections, conducting audits on servicing licensees and ensure a safe public weighbridges, examining trading practices, inspecting pre-packed articles, investigating consumer complaints, using and maintaining equipment and standards and the safety, quality, communication, materials handling, recording and reporting associated with verification/certification or in-service inspection, or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

The unit requires integrated demonstration of all elements and their related performance criteria. Compliance with inspection procedures, audit procedures, test procedures and legislative requirements. Assessment to be conducted over time across a range of workplace scenarios; continuous learning/assessment (re-qualification) required.

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted trade measurement techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 15.21B B Conduct audits of servicing licensees and public weighbridge licensees

Band – Specialisation band B

Field – Quality

Unit Weight 4

This unit is designed for those performing trade measurement inspection/certification activities in public or private enterprises. The unit covers the competency required

to audit the work undertaken by servicing licensees/certifiers and the operations undertaken by public weighbridge licensees.

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices

11.11A Manual handling

12.5B Calibrating measuring equipment

15.20B Perform verification/certification or in-service inspection

18.1A Use hand tools

9.1A Draw and interpret sketch

12.3A Precision mechanical measurement

13.3A Work safely with industrial chemicals and materials

16.2A Participate in formal interviews and negotiations

18.2A Use power tools/hand held operations

9.2A Interpret technical drawing

12.4A Precision electrical/electronic measurement

15.17B Use and maintain reference standards

16.4A Perform internal/external customer service

Element 15.21B.1 Explain the licensing system for servicing licensees and public weighbridges

Criteria 15.21B.1.1

Major components of the licensing system for certification of measuring instruments are described

Assessor guide: observe that –

Assessor guide: confirm that –

Major components of the licensing system for certification of measuring instruments such as legislative requirements, eligibility, conditions of licence including provision of competent employees, provision of reference standards, use of test procedures, and use of reporting documentation and quality assurance systems can be explained

Criteria 15.21B.1.2

Major components of the licensing system for public weighbridges are described

Assessor guide: observe that –

Assessor guide: confirm that –

Major components of the licensing system for public weighbridge such as legislative requirements, eligibility, conditions of licence including provision of competent employees, maintaining accuracy of the public weighbridge, weighing methods and obligations, and use of reporting documentation, can be explained

Criteria 15.21B.1.3

The requirements for issuing servicing and public weighbridge licences in accordance with legislation and organisational procedures are described

Assessor guide: observe that –

Assessor guide: confirm that –

The process for issuing servicing and public weighbridge licences specifically the activities undertaken by trade measurement personnel can be described

Element 15.21B.2 Identify measuring instruments for audit of certifiers**Criteria 15.21B.2.1**

Servicing licensee's documentation is monitored for compliance with organisational requirements

Assessor guide: observe that –

Servicing licensee's documentation is evaluated for its completeness of information. Lodgement of servicing licensee's documentation is monitored for compliance with the specific timeframes required by the administering authority.

Assessor guide: confirm that –

The process for handling incomplete forms can be described.

Criteria 15.21B.2.2

Organisational procedures are used to generate a list of measuring instruments to be audited.

Assessor guide: observe that –

Selection of instruments for auditing is conducted in accordance with organisational procedures. Audits are scheduled to compliment other inspection activities whilst maximising organisational efficiencies and effectiveness.

Assessor guide: confirm that –

Certifier's performance history has been considered when selecting instruments.

Element 15.21B.3 Conduct performance audits on certifiers**Criteria 15.21B.3.1**

Inspection of measuring instruments is performed to determine compliance in accordance with legislation and organisational procedures.

Assessor guide: observe that –

Measuring instruments are tested in accordance with organisational procedures and legislative requirements. Instrument errors are recorded.

Assessor guide: confirm that –

Inspection variations between verification inspection and an audit inspection can be identified and explained.

Criteria 15.21B.3.2

The certifier's procedures and documentation are assessed to ensure legislative requirements are met.

Assessor guide: observe that –

The certifier's documentation is assessed for accuracy against the instrument certified and legislative requirements.

Assessor guide: confirm that –

Criteria 15.21B.3.3

Results of audit are recorded in the organisation's information system.

Assessor guide: observe that –

Audit reports are completed accurately and in a timely manner.

Assessor guide: confirm that –

Reporting variations for a range of instruments can be outlined.

Criteria 15.21B.3.4

Action required to remedy non-compliance is determined and applied.

Assessor guide: observe that –

Appropriate remedial action to be undertaken is determined and implemented. Where non-compliance is identified, existing identification marks are removed and appropriate notices and instructions are provided to the trader. Advice for resolving detected problems is provided to the trader. Any detected breach is investigated and reported in accordance with organisational guidelines.

Assessor guide: confirm that –

Element 15.21B.4 Examine public weighbridge licensee's operations for compliance with legislation**Criteria 15.21B.4.1**

Licensee's documentation is assessed for compliance with legislation and organisational requirements

Assessor guide: observe that –

The licensee's documentation is assessed for accuracy against the public weighbridge instrument certified and legislative requirements. Signage, certificates and public weighbridge tickets are assessed for accuracy and completeness. Public weighbridge operator's authorisation is

Assessor guide: confirm that –

Requirements to complete a public weighbridge ticket can be described. Methods to complete a public weighbridge ticket can be described. Requirements for authority to operate a public weighbridge are described.

Criteria 15.21B.4.2

The operator's ability to undertake public weighbridge duties is observed for compliance with legislation

Assessor guide: observe that –

The evaluation of the operator's ability to perform the duties of a public weigher is undertaken

Assessor guide: confirm that –

"Duties of Operator of Public Weighbridge" can be explained

Criteria 15.21B.4.3

Action required to remedy non-compliance is determined and applied.

Assessor guide: observe that –

Appropriate action to be undertaken is determined and implemented. Advice for resolving any non-compliance is provided to the trader including any written notices. Any detected breach is investigated and reported in accordance with organisational guidelines

Assessor guide: confirm that –

A range of options to remedy non-compliance can be explained

Range statement

The range of variables provides information about the context in which the unit of competency is carried out. It allows for differences between States and Territories and the Commonwealth and between organisations and workplaces. It allows for different work requirements, work practices, and knowledge. The range of variables also provides a focus for assessment and relates to the unit as a whole.

Range Name**Description**

Legislation and policies	Enabling legislation, workplace, health & safety practices, organisational policies and procedures Licensing conditions, enforcement policies
Recommendations for further action	Oral and written instructions, warnings, cautions, infringement notices, non-compliance notices, legal action
Reference material	Uniform test procedures, inspectors handbook, NSC certificates of approval, organisational procedures and guidelines
Documentation	Application forms, certification forms, non-compliance forms, public weighbridge tickets, documents as specified by Legislation, educational material/brochures, batch test histograms
Workplace Health and safety considerations	Storage of test equipment, site/premises conditions, manual handling techniques, specific safety equipment and clothing

Evidence guide**Assessment context**

This unit may be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge. Assessment is to be conducted over time across a range of workplace scenarios; continuous learning/assessment (re-qualification) is required.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the conduct of routine field inspections, examining trading practices, investigating consumer complaints, using and maintaining equipment and standards, performing verification/certification or in-service inspection and the safety, quality, communication, materials handling, recording and reporting associated with conducting audits of servicing licensees and public weighbridge licensees, or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted trade measurement techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

of servicing licensees and public weighbridge licensees, or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

The unit requires integrated demonstration of all elements and their related performance criteria. Compliance with inspection procedures, audit procedures, test procedures and legislative requirements. Assessment to be conducted over time across a range of workplace scenarios; continuous learning/assessment (re-qualification) required.

Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 15.22A A Verify reference standards

Band – Specialisation band A

Field – Quality

Unit Weight 8

Notes - This unit has dual status and is to be regarded as both a Specialisation band A unit and Specialisation band B unit for progression to C5 (AQF level V)

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices

9.1A Draw and interpret sketch

9.2A Interpret technical drawing

12.3A Precision mechanical measurement

18.1A Use hand tools

Element 15.22A.1 Identify the categories and levels of verification for reference standards

Criteria 15.22A.1.1

The categories of reference standards that the organisation is authorised to verify is identified.

Assessor guide: observe that –
Verifying status for the organisation is checked.

Assessor guide: confirm that –
Relevant categories of reference standards for which the organisation is authorised to verify can be identified.

Criteria 15.22A.1.2

The classes of reference standards required to verify a range of standards are identified.

Assessor guide: observe that –
Suitable reference standards within standards hierarchy are researched and identified for verification.

Assessor guide: confirm that –
A range of classes for reference standards can be identified.

Criteria 15.22A.1.3

Tolerances for a range of reference standards are identified.

Assessor guide: observe that –
Correct reference manuals are accessed to gain appropriate information concerning tolerances for reference standards.

Assessor guide: confirm that –
Appropriate tolerance can be explained for a range of reference standards.

Criteria 15.22A.1.4

Tolerances for a range of reference standards are described.

Assessor guide: observe that –

Assessor guide: confirm that –
Appropriate tolerance can be explained for a range of reference standards.

Element 15.22A.2 Maintain suitable environmental conditions to facilitate verification of reference standards

<p>Criteria 15.22A.2.1 Reference standard details are recorded in accordance with organisational guidelines.</p>	<p><i>Assessor guide: observe that –</i> The organisation's information tracking documentation is completed.</p>	<p><i>Assessor guide: confirm that –</i> Current status of client's reference standards can be identified.</p>
<p>Criteria 15.22A.2.2 Sources of possible operational error in the verification of reference standards are identified.</p>	<p><i>Assessor guide: observe that –</i> Identification of operational error relevant to the verification is demonstrated.</p>	<p><i>Assessor guide: confirm that –</i></p>
<p>Criteria 15.22A.2.3 Required atmospheric conditions for the verification of a range of reference standards are applied.</p>	<p><i>Assessor guide: observe that –</i> Appropriate atmospheric conditions are identified for the verification to be conducted. Where atmospheric conditions are found to be unsuitable for verification, remedial action is determined and undertaken.</p>	<p><i>Assessor guide: confirm that –</i> Atmospheric factors required for verifying a range of reference standards can be described. Remedial action for atmospheric deficiencies can be described.</p>
<p>Criteria 15.22A.2.4 Environmental conditions are assessed to determine whether a verification can be conducted.</p>	<p><i>Assessor guide: observe that –</i> Environmental conditions are identified for the verification to be completed. Where environmental conditions are found to be unsuitable for verification, remedial action is determined and undertaken.</p>	<p><i>Assessor guide: confirm that –</i> Environmental factors that may adversely influence the integrity of the reference standards can be identified. Remedial action for a range of environmental deficiencies can be described.</p>

Element 15.22A.3 Examine the design and required markings for a range of reference standards

<p>Criteria 15.22A.3.1 The identification marking required for reference standards is located and explained.</p>	<p><i>Assessor guide: observe that –</i> Identification marks on reference standards are located.</p>	<p><i>Assessor guide: confirm that –</i> Requirements for identification marking on reference standards are understood and can be explained.</p>
<p>Criteria 15.22A.3.2 Design features of a range of reference standards are correctly identified and applied.</p>	<p><i>Assessor guide: observe that –</i> Design features are researched in appropriate reference material and identified on a range of reference standards.</p>	<p><i>Assessor guide: confirm that –</i> The purpose of design specifications can be explained.</p>

Criteria 15.22A.3.3

The function of major components for a range of reference standards is described and applied.

Assessor guide: observe that –

Major components are correctly identified and located on a range of reference standards.

Assessor guide: confirm that –

The purpose of the major components and functions of reference standards can be explained.

Criteria 15.22A.3.4

The fundamental features of a range of reference standards are identified and explained.

Assessor guide: observe that –

Fundamental features are correctly identified and located on a range of reference standards.

Assessor guide: confirm that –

The fundamental features of reference standards can be explained.

Element 15.22A.4 Perform verification of reference standards**Criteria 15.22A.4.1**

A variety of reference standards are verified.

Assessor guide: observe that –

Verification processes are undertaken in relation to various types of reference standards. Test equipment used in the verification processes is used in accordance with organisational guidelines. Methodology for verification is applied in accordance with organisational guidelines.

Assessor guide: confirm that –

The process for maintaining integrity of results including calculations is understood and can be explained.

Criteria 15.22A.4.2

Uncertainty and tolerances for reference standards are applied.

Assessor guide: observe that –

Uncertainty requirements and maximum permissible errors at verification are researched for reference standards. Uncertainty and maximum permissible errors for reference standards are applied.

Assessor guide: confirm that –

The reference material for uncertainty and maximum permissible errors for a variety of reference standards can be accessed and explained.

Criteria 15.22A.4.3

Results of verification are documented and Certificate of Verification issued in accordance with organisational procedures.

Assessor guide: observe that –

Verification work sheets are completed. Verification results are recorded accurately. Certificates of Verification are completed and issued in accordance with organisational procedures.

Assessor guide: confirm that –

The process for producing Certificates of Verification in accordance with verifying authority status can be explained.

Range statement

The range of variables provides information about the context in which the unit of competency is carried out. It allows for differences between States and Territories and the Commonwealth and between organisations and workplaces. It allows for different work requirements, work practices, and knowledge. The range of variables also provides a focus for assessment and relates to the unit as a whole.

Range Name	Description
Reference material	Australian standards, verifying authorities handbook, manufacturers operating manuals, organisational procedures, ISO guide, quality control manuals
Forms of documentation used	Fees, verification work sheets, Certificate of Verification
Operating procedures	Manufacturer's specifications, industry guidelines, Australian Standards, Legislation, Organisational procedures and guidelines
Reference standards	Mass, volume, density, area, length, master meters, temperature
Legislation and Policies	Enabling legislation, Workplace Health and Safety legislation, organisational procedures and guidelines
Specialist Equipment	Reference Standards, measuring devices, safety equipment
Workplace Health & Safety Considerations	Storage and transportation of test equipment, handling of test equipment, handling of hazardous materials, safety clothing, manual handling techniques, site/premises conditions

Evidence guide

Assessment context

This unit may be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge. Assessment is to be conducted over time across a range of workplace scenarios; continuous learning/assessment (re-qualification) required

Critical aspects

This unit could be assessed in conjunction with any other units addressing the use and maintenance of equipment and standards, or other units requiring the exercise of the skills and knowledge covered

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; -

by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

accepted trade measurement techniques, practices, processes and workplace procedures.

The unit requires integrated demonstration of all elements and their related performance criteria. Compliance with inspection procedures, audit procedures, test procedures and legislative requirements.

Assessment to be conducted over time across a range of workplace scenarios; continuous learning/assessment (re-qualification) is required.

plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use

Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 16.1B A Give formal presentations and take part in meetings

Band – Specialisation band B

Field – Communication

Unit Weight 2

Notes - This unit can be regarded as a Specialisation band A unit from C11 onwards

Element 16.1B.1 Participate in formal meetings

Criteria 16.1B.1.1

A set agenda is understood and followed.

Assessor guide: observe that –

The agenda is followed during the meeting.

Assessor guide: confirm that –

The topics for discussion during the meeting can be identified.

Criteria 16.1B.1.2

Meeting conventions are followed.

Assessor guide: observe that –

The meeting rules/conventions are followed at all times.

Assessor guide: confirm that –

Meeting conventions can be identified.

Criteria 16.1B.1.3

Discussion is focussed on the objectives of the meeting.

Assessor guide: observe that –

Discussions are focussed on the objectives of the

Assessor guide: confirm that –

The objective of the meeting can be identified.

Element 16.1B.2 Give formal presentations

Criteria 16.1B.2.1

Presentation of a technical, job related or trade nature is given.

Assessor guide: observe that –

A prepared technical/job related presentation is given clearly and concisely. Where appropriate, visual aids and/or handout materials are used.

Assessor guide: confirm that –

The topic/subject on which a presentation is to be made can be identified.

Criteria 16.1B.2.2

Presentations are accurate and structured and all necessary content is included.

Assessor guide: observe that –

The information presented in the presentation is accurate and factual. The presentation is logically structured. All relevant material is included in the presentation.

Assessor guide: confirm that –

The structure of the presentation can be identified. The information to be conveyed can be identified. Any conclusions, recommendations are made on the basis of information contained in the presentation.

Criteria 16.1B.2.3

Sources are acknowledged.

Assessor guide: observe that –

The sources of information used in the presentation are acknowledged.

Assessor guide: confirm that –

The sources of information used in the presentation can be identified.

Range statement

This unit is intended to cover the communication skills needed when individuals are required to make formal presentations and participate in meetings governed by formal rules or well-established conventions. For example, meetings which have a formal chairperson, minutes are recorded, and where roles are relatively well-defined.

Evidence guide**Assessment context**

This unit may be assessed on the job, off the job, or a combination of on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units applicable to the individual's work and/or units requiring the exercise of the skills and knowledge covered by this unit.

Assessment conditions

The candidate will be provided with : - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment, the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities.

Unit MEM 16.2A B Participate in formal interviews and negotiations

Band – Specialisation band A

Field – Communication

Unit Weight 4

Element 16.2A.1 Plan and conduct interviews

Criteria 16.2A.1.1

Plan and initiate interview to achieve a specified purpose.

Assessor guide: observe that –

The interview is appropriately planned and initiated.

Assessor guide: confirm that –

The purpose of the interview can be given. The need to initiate the interview can be explained. The procedures to be followed in planning the interview can be identified.

Criteria 16.2A.1.2

Suitable questions appropriate to the purpose are used.

Assessor guide: observe that –

Suitable questions appropriate to the purpose of the interview are used to obtain details and/or information.

Assessor guide: confirm that –

The detail/information to be obtained from the interview can be identified. Questions appropriate to the detail/information to be obtained can be prepared.

Criteria 16.2A.1.3

Discretion and confidentiality are exercised where appropriate.

Assessor guide: observe that –

Where appropriate, detail and/or information obtained is treated discreetly and confidentially.

Assessor guide: confirm that –

The need to treat details and/or information discreetly and confidentially can be explained.

Element 16.2A.2 Participate in interviews

Criteria 16.2A.2.1

Appropriate preparation is undertaken.

Assessor guide: observe that –

Appropriate preparation for the interview is undertaken.

Assessor guide: confirm that –

All necessary preparations for the interview can be identified.

<p>Criteria 16.2A.2.2 Active listening skills are employed.</p>	<p><i>Assessor guide: observe that –</i> Active listening skills are utilised during the interview.</p>	<p><i>Assessor guide: confirm that –</i> Active listening techniques that can be applied in interview situations can be described.</p>
<p>Criteria 16.2A.2.3 Self-presentation is appropriate to the purpose.</p>	<p><i>Assessor guide: observe that –</i> The individual's presentation during the interview is appropriate to the purpose of the interview.</p>	<p><i>Assessor guide: confirm that –</i> The effect(s) of the individual's presentation during the interview upon the interview, can be explained.</p>
<p>Criteria 16.2A.2.4 Questions are asked where appropriate.</p>	<p><i>Assessor guide: observe that –</i> Questions are asked at appropriate times during the interview.</p>	<p><i>Assessor guide: confirm that –</i> The effect(s) of the timing of questions on the interviewee can be explained.</p>
<p>Criteria 16.2A.2.5 Follow-up activities are clarified and reported in accordance with standard operating procedure.</p>	<p><i>Assessor guide: observe that –</i> Where appropriate, follow-up activities to be undertaken are clarified. Where appropriate, follow-up activities are reported in accordance with standard operating procedures.</p>	<p><i>Assessor guide: confirm that –</i> The need to follow-up issues raised during the interview can be explained. The procedures for reporting the outcomes of follow-up activities can be identified.</p>
<p>Element 16.2A.3 Take part in negotiations</p>		
<p>Criteria 16.2A.3.1 Language appropriate to the other party is used.</p>	<p><i>Assessor guide: observe that –</i> Language appropriate to the other party(s) is used throughout the negotiations.</p>	<p><i>Assessor guide: confirm that –</i> The parties to be involved in the negotiations can be identified. The reasons for using appropriate language can be explained.</p>
<p>Criteria 16.2A.3.2 Own and others needs/wants are stated and clarified.</p>	<p><i>Assessor guide: observe that –</i> The individual's needs/wants are stated. The needs/wants of others are clarified.</p>	<p><i>Assessor guide: confirm that –</i> The reasons for clarifying the needs/ wants of others can be explained. The needs/wants of the individual can be identified.</p>

Criteria 16.2A.3.3

Represent the views of fellow employees including own group or team to others.

Assessor guide: observe that –

The individual represents the views of fellow team or group members during the negotiations.

Assessor guide: confirm that –

The views of fellow team or group members can be identified. The views of fellow team or group members are clarified and confirmed.

Criteria 16.2A.3.4

Select appropriate communication medium.

Assessor guide: observe that –

The individual uses appropriate communication media during the negotiations.

Assessor guide: confirm that –

A range of communication media can be identified. The appropriate communication media is selected. The reasons for selecting the chosen communication medium can be given.

Criteria 16.2A.3.5

Follow-up activities are clarified and reported in accordance with standard operating procedure.

Assessor guide: observe that –

Where appropriate, follow-up activities to be undertaken are clarified. Where appropriate, follow-up activities are reported in accordance with standard operating procedures.

Assessor guide: confirm that –

The need to follow-up issues raised during negotiations can be explained. The procedures for reporting the outcomes of follow-up activities can be identified.

Range statement

This unit covers the skills needed for effective communication in more formal on-site or small group situations where ideas are defined and specific outcomes are sought. The topics covered are often formally identified and records may be kept. Interviews could include job recruitment and progression, performance reviews, grievance, etc. This unit does not cover the skills needed for participation in formal group processes such as meetings which are covered by Unit 16.1B (Give formal presentations and take part in meetings). For interviews associated with assessment, see Unit 17.2A (Conduct workplace assessment).

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with formal interviews and/or negotiations or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 16.3B A Advanced customer service

Band – Specialisation band B

Field – Communication

Unit Weight 2

Notes - Pre-requisite skills for this unit are covered by core units 1.1F, 1.3F, and 2.1C12.

Element 16.3B.1 Identify customer relationship to enterprise

Criteria 16.3B.1.2

For repeat customers, formal customer identification details obtained and checked, for example by order, requisition or account number according to standard operating procedure.

Assessor guide: observe that –

For repeat customers, customer identification details are obtained and checked in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for identifying repeat customers can be given. The procedures for checking customer identification details can be given. The identification details to be sought from repeat customers can be identified.

Criteria 16.3B.1.3

Customer is identified as a new or repeat customer.

Assessor guide: observe that –

The customer is identified correctly as a new or repeat customer.

Assessor guide: confirm that –

The distinction between new and repeat customers can be explained.

Element 16.3B.2 Identify customer requirements

Criteria 16.3B.2.1

Customer requirements identified from order or other verbal or written communication.

Assessor guide: observe that –

Assessor guide: confirm that –

The means by which customer requirements are identified can be given. The customer requirements can be identified from a number of given sources.

Criteria 16.3B.2.2

Degree to which customer requirements can be met is clearly communicated including details such as price, delivery date, quantity or quality.

Assessor guide: observe that –

The degree to which customer requirements can be met is clearly and promptly communicated, using appropriate means.

Assessor guide: confirm that –

The price of the required product or service can be identified. The quantities of the product available can be identified. The quality of the product available can be identified. The delivery date of the product or service can be identified. The ability to supply the customer's requirements can be identified. The procedures for informing the customer of the degree to which the customer's requirements can be met can be identified. The reasons for informing the customer promptly of the ability/inability to meet the customer's requirements can be explained.

Criteria 16.3B.2.3

Alternatives proposed for any inability to completely satisfy customer requirements.

Assessor guide: observe that –

Where appropriate, alternative products and/or services are proposed to the customer.

Assessor guide: confirm that –

Alternative products and/or services that may meet the customer's requirements can be identified.

Element 16.3B.3 Action customer requirements**Criteria 16.3B.3.1**

Identified appropriate action to implement customer requirements is undertaken, for example filling or entering of order, corrective action to resolve complaints, or repair or service to customer equipment.

Assessor guide: observe that –

The appropriate action is taken to meet customer requirements.

Assessor guide: confirm that –

The procedures for actioning customer orders can be identified. The procedures for recording and actioning customer complaints can be identified. The procedures for initiating repairs and/or service to customer equipment can be identified. The procedures for initiating action to correct errors made while attempting to meet customer requirements can be identified. For a range of customer requirements, the appropriate action to be taken can be identified. The reasons for taking the action identified can be explained.

Criteria 16.3B.3.2

Customer requirements not able to be met immediately are recorded and follow-up checks undertaken according to standard operating procedure.

Assessor guide: observe that –

Customer requirements not able to be immediately met are recorded in accordance with standard operating procedure. Unmet customer requirements are followed up in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for recording customer requirements not able to be immediately met can be identified. The procedures for following up on unmet customer requirements can be identified.

Element 16.3B.4 Promote better customer service**Criteria 16.3B.4.1**

Methods of improving customer service are identified and reported.

Assessor guide: observe that –

Where appropriate, methods of improving customer service are reported/recommended in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for reporting/ recommending improvement to customer service can be identified.

Range statement

This unit covers the knowledge and skills required for the provision of comprehensive assistance to customers across a range of products and services. Situations covered would be beyond simple sales or enquiries and could include the taking of one-off or special orders requiring detailed descriptions, the handling of complaints referred for more detailed assistance than the initial point of contact, work as a designated liaison officer etc. Customers can be internal or external. Customer liaison can be undertaken through telephone, written, e-mail or face-to-face contact. Typical applications of this unit would be found in warehouses, service and design departments.

Evidence guide

Assessment context

This unit should be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with customer service or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 16.4A A Perform internal/external customer service

Band – Specialisation band A

Field – Communication

Unit Weight 2

Element 16.4A.1 Identify customer requirements

Criteria 16.4A.1.1

Customer requirements identified from verbal or written communication.

Assessor guide: observe that –

Assessor guide: confirm that –

The means by which customer requirements are identified can be given.

Criteria 16.4A.1.2

Degree to which customer requirements can be met is clearly communicated including details such as cost, delivery date, quantity or quality.

Assessor guide: observe that –

Customer requirements can be met is clearly and promptly communicated, using appropriate means.

Assessor guide: confirm that –

The cost of the required product or service can be identified. The quantities of the available product can be identified. The quality of the available product can be identified. The delivery date of the product or service can be identified. The reasons for informing the customer promptly of the ability/inability to meet the customer requirements can be explained.

Criteria 16.4A.1.3

Alternatives proposed for any inability to completely satisfy customer requirements.

Assessor guide: observe that –

Where appropriate, alternative products and/or services are proposed to the customer in accordance with standard operating procedures.

Assessor guide: confirm that –

Alternative products and/or services that may meet the customer's requirements can be identified.

Element 16.4A.2 Action customer requirements

Criteria 16.4A.2.1

Appropriate action taken to implement customer requirements.

Assessor guide: observe that –

Appropriate action taken to implement customer requirements in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for actioning customer orders can be identified. The procedures for recording and actioning customer complaints can be identified.

Criteria 16.4A.2.2

Customer requirements not able to be met are recorded and followed up.

Assessor guide: observe that –

Customer requirements not able to be met are recorded and follow up checks undertaken according to standard operating procedures.

Assessor guide: confirm that –

The procedure for recording customer requirement which are not met can be identified. The procedures for following up on customer requirements which are not met can be identified.

Range statement

This unit covers the knowledge and skills required for the provision of assistance to internal/external customers across a range of products and services. Situations covered would go beyond simple sales and enquiries and could include taking one-off or special orders requiring detailed descriptions or handling of complaints. Customers liaison can be undertaken through telephone, written, e-mail or face to face contact. Typical applications of this unit would be found in service and design departments. This unit should not be selected when Unit 16.3B (Advanced customer service) has already been selected.

Evidence guide**Assessment context**

This unit may be assessed on the job, off the job or a combination of on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with customer service or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 17.1A A Assist in development and deliver training in the workplace

Band – Specialisation band A

Field – Training

Unit Weight 2

Notes - This unit is intended to equate with Workplace Trainer Category 1 This unit has dual status and is to be regarded as both a Specialisation band A unit and Specialisation band B unit for progression to C5 (AQF level V)

Pre-requisite units - Path 1

2.4C11 Assist in the provision of on the job training

Element 17.1A.1 Plan for delivery of on-the-job training

Criteria 17.1A.1.1

Objectives of training and competency to be achieved are identified.

Assessor guide: observe that –

Assessor guide: confirm that –

The competencies to be achieved through the training can be identified.

Criteria 17.1A.1.2

Role in provision of training clarified.

Assessor guide: observe that –

Assessor guide: confirm that –

The role of the trainer in the provision of training can be described.

Element 17.1A.2 Deliver on-the-job training

Criteria 17.1A.2.1

Training objectives explained to trainee.

Assessor guide: observe that –

The trainer explains the training objectives and competencies to be achieved to the trainee.

Assessor guide: confirm that –

Criteria 17.1A.2.2

Training carried out using appropriate techniques: logical presentation; sound communication methods; explanation, demonstration; practice; feedback.

Assessor guide: observe that –

The training is carried out using appropriate techniques.

Assessor guide: confirm that –

The training techniques to be used in delivering the training can be identified. The reasons for selecting the chosen training techniques can be explained.

Criteria 17.1A.2.3

Trainee progress monitored and constructive feedback provided to trainee.

Assessor guide: observe that –

Positive feedback is provided to the trainee throughout the training program. Trainee progress is monitored and recorded in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for recording trainee progress can be given. The reasons for providing positive feedback can be given.

Element 17.1A.3 Review training program**Criteria 17.1A.3.1**

Training program evaluated according to standard operating procedure.

Assessor guide: observe that –

The training program is evaluated in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for evaluating training programs can be given. The reasons for evaluating training programs can be explained.

Criteria 17.1A.3.2

Training data recorded according to standard operating procedure.

Assessor guide: observe that –

Training data is recorded in accordance with standard operating procedures.

Assessor guide: confirm that –

The training records to be kept can be identified. The procedures for recording training data can be given.

Criteria 17.1A.3.3

Report on training according to standard operating procedure.

Assessor guide: observe that –

Reports on training completed and training required, are completed in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for preparing training reports can be given.

Criteria 17.1A.3.4

Promote training according to standard operating procedure.

Assessor guide: observe that –

Training is promoted within the workplace in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for promoting training in the workplace can be given. The reasons for promoting training in the workplace can be explained/

Range statement

Training is delivered in a one-to-one or small group situation. The training may be structured or informal and based on co-operation between trainer and other training personnel. Both underpinning knowledge and practical skills are covered by the training. Training may be applied to technical, induction, OHS, or other areas. Normal supervision of an apprentice is covered by Unit 2.4C11 (Assist in the provision of on the job training). This unit does not cover assessment. Assessor skills are covered in Unit 17.2A (Conduct workplace assessment).

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the development and delivery of training or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 17.2A A Conduct workplace assessment

Band – Specialisation band A

Field – Training

Unit Weight 2

Notes - This unit has dual status and is to be regarded as both a Specialisation band A unit and Specialisation band B unit for progression to C5 (AQF level V)

Element 17.2A.1 Identify and plan assessment requirements

Criteria 17.2A.1.1

Area and purpose of assessment identified in consultation with appropriate personnel and person(s) being assessed.

Assessor guide: observe that –

Assessor guide: confirm that –

The area and purpose of the assessment can be identified. The persons to be consulted when determining the assessments to be carried out can be identified.

Criteria 17.2A.1.2

Appropriate competency standard(s) and assessment guides identified and selected as required.

Assessor guide: observe that –

All relevant competency standards and assessment guides are obtained in accordance with workplace procedures.

Assessor guide: confirm that –

The relevant competencies can be identified.

Criteria 17.2A.1.3

Evidence required to established competency determined in accordance with industry assessment procedure.

Assessor guide: observe that –

Assessor guide: confirm that –

The evidence required to establish competency can be identified. The reasons for identifying the evidence to be obtained can be given. The industry assessment procedure can be given.

Criteria 17.2A.1.4

Evidence required and assessment arrangements discussed and confirmed in an appropriate way with person being assessed.

Assessor guide: observe that –

The evidence required and the assessment arrangements are discussed and confirmed with the person being assessed.

Assessor guide: confirm that –

The reasons for discussing and confirming the assessment arrangements with the person being assessed can be explained.

Element 17.2A.2 Carry out assessment

Criteria 17.2A.2.1

Agreed assessment procedure implemented in a manner, time and location to maximise active participation from assessee(s).

Assessor guide: observe that –

The assessment is carried out in an appropriate manner at a time and location agreed to by all parties.

Assessor guide: confirm that –

The time and location of the assessment can be identified. The reasons for selecting the chosen time and location for the assessment can be given.

Criteria 17.2A.2.2

Evidence consistent with the agreed assessment procedure is gathered using appropriate and specified methods and tools and documented according to agreed industry or site procedures.

Assessor guide: observe that –

Evidence is gathered in accordance with the agreed methods and procedures. The evidence gathered is documented in accordance with standard operating procedures.

Assessor guide: confirm that –

The methods of gathering the evidence can be identified. The reasons for using the selected methods of obtaining evidence can be explained. The procedures for documenting the assessment can be given.

Criteria 17.2A.2.3

Evaluation and assessment decisions made in accordance with agreed assessment procedures.

Assessor guide: observe that –

The evidence is evaluated and assessment decisions made in accordance with the agreed assessment procedures.

Assessor guide: confirm that –

The procedures for evaluating the gathered evidence can be given.

Criteria 17.2A.2.4

Clear and appropriate feedback provided to person(s) assessed.

Assessor guide: observe that –

Clear and appropriate feedback is provided to the assessee.

Assessor guide: confirm that –

The need to provide clear and positive feedback to the assessee can be given.

Criteria 17.2A.2.5

Provide advice to assessee(s) on training needs, appeal mechanisms as appropriate.

Assessor guide: observe that –

Where appropriate, advice is provided to the assessee on training needs and/or the appeals procedures.

Assessor guide: confirm that –

The appeals procedure can be given. Where appropriate the further training required by the assessee can be identified.

Element 17.2A.3 Record results and review the procedure

Criteria 17.2A.3.1

Assessment results recorded in accordance with industry or site procedures.

Assessor guide: observe that –

Assessment results are recorded in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for recording assessment results can be given.

Criteria 17.2A.3.2

Records kept/stored in a manner appropriate to maintenance of confidentiality and safety.

Assessor guide: observe that –

Records are safely and securely stored in accordance with standard operating procedures.

Assessor guide: confirm that –

The need to keep records securely stored can be explained. The procedures for storing assessment records can be given.

Criteria 17.2A.3.3

Assessment procedure reviewed in co-operation with person being assessed and revised if appropriate.

Assessor guide: observe that –

The assessment procedure is reviewed in cooperation with the assessee. Where appropriate, the assessment procedure is revised in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for reviewing assessments undertaken can be given. The reasons for evaluating assessment methods/procedures can be explained. The procedures for revising assessment procedures can be given.

Range statement

Appropriate assessment techniques will be selected based on assessor knowledge of the competency to be assessed or in conjunction with someone who is competent (technical expert). Methods may include observation, documentation, demonstration, projects, oral tests, computer based assessment, written tests, etc. Purpose of assessment may include recognition of prior learning, determination of award classification level or identification of training needed. Evidence gathered should address task skills, task management, contingency management application. Assessment methods and tools should address issues such as clarity, reliability, validity of results, fairness in assessment application and cost effectiveness of process. Assessment may be undertaken on an individual basis or in groups. This unit is intended to equate to national competency standards. Assessment Standard Unit: Conduct assessment in accordance with an established procedure and the Extension Unit: Plan and review assessment. This competency also meets the assessment skills required to be a recognised MERS ITAB workplace assessor.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with workplace assessment or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 18.1A B Use hand tools

Band – Specialisation band A

Field – Maintenance & diagnostics

Unit Weight 2

Element 18.1A.1 Use hand tools

Criteria 18.1A.1.1

Appropriate hand tools selected according to the task requirements.

Assessor guide: observe that –

The appropriate hand tools are selected in accordance with the task requirements.

Assessor guide: confirm that –

The task(s) to be performed can be identified. The appropriate hand tools for the task(s) to be performed can be selected from a range of hand tools provided. The reasons for selecting the chosen hand tools can be explained.

Criteria 18.1A.1.2

Hand tools used to produce desired outcomes to job specifications which may include finish, tension, size or shape.

Assessor guide: observe that –

The appropriate hand tools are used to produce the desired outcomes to job specifications.

Assessor guide: confirm that –

The outcomes to be achieved by the use of hand tools can be identified. The job specifications to be achieved by the use of hand tools can be identified.

Criteria 18.1A.1.3

All safety requirements are adhered to before, during and after use.

Assessor guide: observe that –

All safety procedures are followed at all times and appropriate personal protective clothing and safety equipment are used.

Assessor guide: confirm that –

The safety procedures to be followed before, during and after the use of hand tools can be identified. The personal protective clothing and safety equipment to be used when using hand tools can be identified.

Criteria 18.1A.1.4

Unsafe or faulty tools identified and marked for repair according to designated procedures before, during and after use.

Assessor guide: observe that –

Where appropriate, unsafe or faulty tools identified before, during or after use are marked for repair in accordance with standard operating procedures.

Assessor guide: confirm that –

Common faults and/or defects in hand tools can be identified. The procedures for marking unsafe or faulty tools for repair can be given.

Criteria 18.1A.1.5

Routine maintenance of tools, including hand sharpening undertaken according to standard operational procedures, principles and techniques.

Assessor guide: observe that –

Where appropriate, hand tools are maintained/sharpened using appropriate techniques in accordance with standard operating procedures.

Assessor guide: confirm that –

The routine maintenance requirements of a range of hand tools can be identified. The procedures for maintaining/sharpening a range of hand tools can be identified. The techniques to be used in maintaining/sharpening a range of hand tools can be identified.

Criteria 18.1A.1.6

Hand tools are stored safely in appropriate location according to standard operational procedures and manufacturer's recommendations.

Assessor guide: observe that –

All hand tools are safely stored in the appropriate location in accordance with manufacturer's/standard operating procedures.

Assessor guide: confirm that –

The storage location of a range of hand tools can be identified. The procedures for storing a range of hand tools can be identified.

Range statement

Work undertaken autonomously or in a team environment using predetermined standards of quality, safety and workshop procedures involving the use of various hand tools, including but not limited to hacksaws, hammers, punches, screwdrivers, sockets, wrenches, scrapers, chisels, gouges, wood planes and files of all cross-sectional shapes and types. Applications may include hand tools used for adjusting, dismantling, assembling and finishing of items or components and the finishing, cutting, scraping of metallic and non-metallic material to size and shape. This includes simple tapping and threading. Routine maintenance tasks may include cleaning, lubricating, tightening, simple tool repairs, hand sharpening and adjustments using engineering principles, tools, equipment and procedures. This unit should not be selected if the hand tool is dedicated to a single operation or machine and if only a machine specific/customised tool is used. For using power tools used for hand held operations see Unit 18.2A (Use power tools/hand held operations).

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the use of hand tools or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 18.2A A Use power tools/hand held operations

Band – Specialisation band A

Field – Maintenance & diagnostics

Unit Weight 2

Element 18.2A.1 Use power tools

Criteria 18.2A.1.1

Appropriate power tools selected according to the task requirements.

Assessor guide: observe that –

The appropriate power tools are selected in accordance with the task requirements.

Assessor guide: confirm that –

The task(s) to be performed can be identified. The appropriate power tools for the task(s) to be performed can be selected from a range of power tools provided. The reasons for selecting the chosen power tools can be explained.

Criteria 18.2A.1.2

Power tools used following a determined sequence of operations which may include clamping, alignment and adjustment to produce desired outcomes to job specifications which may include finish, size or shape.

Assessor guide: observe that –

The appropriate power tools are used to produce the desired outcomes to job specifications. Where appropriate, workpiece is clamped in accordance with standard operating procedures. Where appropriate, the power tool is aligned and adjusted to achieve the desired outcome.

Assessor guide: confirm that –

The outcomes to be achieved by the use of power tools can be identified. The job specifications to be achieved by the use of power tools can be identified. The need to secure workpieces when using power tools can be explained. A range of clamping/securing devices and their application can be identified. The adjustments that can be made to a range of power tools can be identified. The tools and procedures to be used in adjusting a range of power tools can be identified. The need to align power tools to achieve the required outcomes can be identified.

Criteria 18.2A.1.3

All safety requirements are adhered to before, during and after use,

Assessor guide: observe that –

All safety procedures are followed at all times and appropriate personal protective clothing and safety equipment are used,

Assessor guide: confirm that –

The safety procedures to be followed before, during and after the use of power tools can be identified. The personal protective clothing and safety equipment to be used when using power tools can be identified.

Criteria 18.2A.1.4

Unsafe or faulty tools identified and marked for repair according to designated procedures before, during and after use.

Assessor guide: observe that –

Where appropriate, unsafe or faulty tools identified before, during or after use are marked for repair in accordance with standard operating procedures.

Assessor guide: confirm that –

Common faults and/or defects in power tools can be identified. The procedures for marking unsafe or faulty tools for repair can be given.

Criteria 18.2A.1.5

Operational maintenance of tools, including hand sharpening, undertaken according to standard workplace procedures, principles and techniques.

Assessor guide: observe that –

Where appropriate, power tools are maintained/sharpened using appropriate techniques in accordance with standard operating procedures.

Assessor guide: confirm that –

The operational maintenance requirements of a range of power tools can be identified. The procedures for maintaining/sharpening a range of power tools can be identified. The techniques to be used in maintaining/sharpening a range of power tools can be identified.

Criteria 18.2A.1.6

Power tools stored safely in appropriate location according to standard workshop procedure and manufacturer's recommendations.

Assessor guide: observe that –

All power tools are safely stored in the appropriate location in accordance with manufacturer's/ standard operating procedures.

Assessor guide: confirm that –

The storage location of a range of power tools can be identified. The procedures for storing a range of power tools can be identified.

Range statement

Work undertaken autonomously or in a team environment using predetermined standards of quality, safety and workshop procedures involving the use of various power tools, including but not limited to electric or pneumatic drills, grinders, jigsaws, nibblers, cutting saws, sanders, planers, routers, pedestal drills and pedestal grinders. Applications may extend to loosening and fastening of items or components and the finishing, cutting, grinding of metallic and non-metallic materials and/or tool bits to size and shape. Routine maintenance tasks may include cleaning, lubricating, tightening, simple tool repairs and adjustments using engineering principles, tools, equipment and procedures to statutory and regulatory requirements. This unit should not be selected if the power tools used are dedicated to an operation or machine, ie. nut-runner, air drill, power driver etc. For using hand tools see Unit 18.1A (Use hand tools).

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the use of power tools in hand held operations or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 18.3A B Use tools for precision work

Band – Specialisation band A

Field – Maintenance & diagnostics

Unit Weight 4

Pre-requisite units - Path 1

18.1A Use hand tools

18.2A Use power tools/hand held operations

Element 18.3A.1 Use tools to produce precision work to specifications

Criteria 18.3A.1.1

Correct tools, processes and equipment selected according to outcome requirements.

Assessor guide: observe that –

All relevant drawings, specifications, instructions etc. are obtained in accordance with work place procedures.

Assessor guide: confirm that –

The work to be undertaken can be identified. The specifications to be achieved can be identified. The appropriate tools, processes and equipment required to carry out the work to the required specifications are selected. The reasons for selecting the chosen tools, processes and equipment can be explained.

Criteria 18.3A.1.2

Work area prepared and made safe.

Assessor guide: observe that –

The work area(s) is prepared and made safe prior to the work being carried out in accordance with standard operating procedures.

Assessor guide: confirm that –

The hazards associated with using the selected tools, processes and equipment can be identified. The safety procedures to be followed to ensure the safety of the individual and other personnel can be given. The area(s) in which the work is to be carried out can be identified. Any hazards associated with carrying out the work in those area(s) can be identified.

Criteria 18.3A.1.3

Tools used according to acceptable engineering principles, methods, applications and procedures to produce specified outcome.

Assessor guide: observe that –

The appropriate tools are used to produce the specified outcomes in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for using the selected tools can be given. The engineering principles to be applied during the use of the tools can be explained.

Criteria 18.3A.1.4

Tools and equipment inspected for safe and proper working order before, during and after use.

Assessor guide: observe that –

All tools and equipment used are checked for safe and proper working order before, during and after use, in accordance with standard operating procedures.

Assessor guide: confirm that –

The manufacturer's specifications of the tools and equipment selected can be identified. The safe and proper function of tools and equipment selected can be identified. The procedures for checking tools and equipment for correct and safe operation can be given.

Criteria 18.3A.1.5

Unsafe or faulty tools/equipment identified, repaired where appropriate, or marked for repair and/or disposal, according to prescribed procedure.

Assessor guide: observe that –

Where appropriate, unsafe or faulty tools and equipment are marked for repair in accordance with standard operating procedures. Where appropriate, unsafe or faulty tools are repaired/maintained in accordance with standard operating procedures.

Assessor guide: confirm that –

Common faults and/or defects in tools and equipment used/selected can be identified. The procedures for marking unsafe or faulty tools and equipment for repair can be given. The repairs/operational maintenance that can be made to the tools and equipment used/selected can be identified. The procedures for repairing/maintaining the tools and equipment used/selected can be given.

Element 18.3A.2 Tools and equipment stored appropriately**Criteria 18.3A.2.1**

Condition of tools/equipment checked and appropriately actioned.

Assessor guide: observe that –

The condition of all tools and equipment is checked for conformance to specifications and safe and proper operation prior to storage, in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for checking tools and equipment prior to storage can be identified.

Criteria 18.3A.2.2

Tools prepared for storage in appropriate location to standard workshop procedures and manufacturer's recommendations.

Assessor guide: observe that –

All tools and equipment are safely stored in the appropriate location in accordance with standard operating procedures.

Assessor guide: confirm that –

The storage location of the tools and equipment used/selected can be identified. The procedures for storing tools and equipment used/selected can be given.

Range statement

Work undertaken autonomously or in a team environment, using predetermined standards of quality, safety and workshop procedures involving the use of a variety of tools, instruments and power equipment to perform precision tasks. Where specifications are interpreted from engineering drawings, detailed/technical sketches and associated documents, Unit 9.2A (Interpret technical drawing) should be accessed. Skill applications involve precision tasks, including cutting out, drilling, fitting, tapping, filing, reaming, lapping, broaching, burnishing, scraping, polishing, hand held grinding, chiselling to achieve precision outcomes on a range of metallic and non-metallic materials. Inspection and preventative maintenance of tools and equipment involves the visual checking of leads, connections, sharpening of cutting equipment and the repair of associated tools. Tools covered by this unit include any tools required to achieve precision outcomes. Where precision measurement is required, Unit 12.3 A (Precision mechanical measurement) should be accessed. Where precision marking out is required, Unit 12.6 A (Mark off/out (general engineering)) should be accessed.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the use of tools for precision work or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 18.4A A Maintain and overhaul mechanical equipment

Band – Specialisation band A

Field – Maintenance & diagnostics

Unit Weight 4

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices

18.1A Use hand tools

18.5A Bearings - fault diagnosis installation and removal

18.9A Levelling and alignment of machines and engineering components

9.1A Draw and interpret sketch

18.2A Use power tools/hand held operations

18.6A Dismantle/repair/replace/assemble and fit engineering components

18.55A Dismantle, replace and assemble engineering components

9.2A Interpret technical drawing

18.3A Use tools for precision work

18.7A Maintain and repair mechanical drives and mechanical transmission assemblies

Element 18.4A.1 Perform preventative maintenance tasks and adjustments

Criteria 18.4A.1.1

Preventative maintenance schedule read and task requirements determined..

Assessor guide: observe that –

The preventative maintenance schedule is obtained in accordance with work place procedures.

Assessor guide: confirm that –

The preventative maintenance tasks to be undertaken can be identified. The purpose of preventative maintenance can be explained.

Criteria 18.4A.1.2

Using appropriate maintenance principles and techniques, routine maintenance tasks are performed on mechanical equipment, components or sub-assemblies using correct tools, equipment and procedures.

Assessor guide: observe that –

Preventative maintenance tasks are carried out using appropriate tools, techniques, equipment and procedures.

Assessor guide: confirm that –

The procedures for carrying out the maintenance tasks identified in the preventative maintenance schedule can be given. The tools, equipment, techniques and/or procedures to be applied in carrying out the preventative maintenance tasks can be identified. The reasons for selecting chosen tools, equipment, techniques and/or procedures can be given.

Criteria 18.4A.1.3

Mechanical equipment, components, sub-assemblies checked visually and with test equipment, using prescribed procedures and safety requirements to ensure correct function or determine malfunction.

Assessor guide: observe that –

All components of the system being maintained are checked visually and with test equipment to ensure correct function or to determine malfunction in accordance with safety and standard operating procedures.

Assessor guide: confirm that –

The safety procedures to be followed when carrying out preventative maintenance can be given. The procedures for checking/testing the components of the system being maintained can be given. The relevant test equipment and techniques required to test the components of the system can be identified. The correct function of the components of the system being maintained can be described. The visual checks to be undertaken can be identified.

Criteria 18.4A.1.4

Adjustments made to equipment or components to ensure specifications are met using acceptable fitting techniques and procedures, observing all safety requirements.

Assessor guide: observe that –

The system being maintained and/or its components are adjusted in conformance with specifications using appropriate tools, techniques and equipment in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for adjusting the system being maintained and/or its components can be given. The safety procedures to be followed when adjusting the system and/or its components can be given. The adjustments that can be made to the system and/or its components can be identified. The operational specifications of the system and its components can be identified. The tools, techniques and equipment necessary to carry out the adjustments can be identified. The reasons for selecting the chosen tools, techniques and equipment can be given.

Element 18.4A.2 Diagnose and locate faults**Criteria 18.4A.2.1**

Equipment component function determined and understood by reference to engineering drawings, technical manuals and or consultation with appropriate personnel.

Assessor guide: observe that –

All relevant drawings, specifications, manuals and documentation are obtained in accordance with work place procedures. Where appropriate, relevant personnel are consulted with respect to the function and operational requirements of the equipment.

Assessor guide: confirm that –

The equipment function and operational requirements can be identified.

Criteria 18.4A.2.2

Maintenance reports checked, reviewed and faults diagnosed.

Assessor guide: observe that –

Relevant maintenance reports are obtained in accordance with work place procedures.

Assessor guide: confirm that –

Any recurring faults or failures can be identified. The likely causes of any recurring faults or failures can be given.

Criteria 18.4A.2.3

Consultation with operators and other relevant plant personnel is carried out to assist in locating faults.

Assessor guide: observe that –

Operators and other relevant personnel are consulted with respect to equipment faults, failures and out of specification operation.

Assessor guide: confirm that –

All relevant information likely to assist in locating the fault obtained from operators and other personnel can be identified. The reasons for consulting with operators and other relevant personnel can be given.

Criteria 18.4A.2.4

Where appropriate, test equipment selected and applied in accordance with defined requirements and procedures to assist fault location.

Assessor guide: observe that –

Where appropriate, test equipment is used in accordance with standard operating procedures to assist in fault location. Where appropriate, the test results are recorded in accordance with standard operating procedures.

Assessor guide: confirm that –

The test equipment that is available to assist in fault detection/location can be identified. The test procedures, techniques and their application can be given. Where appropriate, the reasons for selecting the chosen test(s) can be given. The procedures for recording test results can be given.

Criteria 18.4A.2.5

Fault condition diagnosed and localised at component level using appropriate test equipment and procedures.

Assessor guide: observe that –

Assessor guide: confirm that –

The test results are used to identify the fault condition at the component level.

Criteria 18.4A.2.6

Faulty condition evaluated and appropriate corrective action taken.

Assessor guide: observe that –

The appropriate action is taken to rectify the fault in the system component(s) in accordance with standard operating procedures.

Assessor guide: confirm that –

The cause of the fault(s) can be identified. The means of correcting the fault(s) can be identified. The reasons for selecting the chosen means of correcting the fault(s) can be explained. The procedures to be followed in undertaking the corrective action can be given. The tools, equipment and techniques to be used in undertaking the corrective action can be identified. The reasons for selecting the chosen tools, equipment and techniques can be given.

Criteria 18.4A.2.7

Faults documented to standard operating procedures.

Assessor guide: observe that –

The faults detected and the maintenance activities carried out in correcting the fault are documented in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for documenting faults and maintenance activities undertaken can be given. The reasons for documenting faults and maintenance activities undertaken can be explained.

Element 18.4A.3 Repair or overhaul mechanical system**Criteria 18.4A.3.1**

Machine or equipment isolated safely or checked for isolation.

Assessor guide: observe that –

The machine or equipment is safely isolated or checked for isolation in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for isolating the machine or equipment can be given. The procedures for checking the machine or equipment for isolation can be given. The reasons for confirming that the machines or equipment to be maintained/overhauled have been isolated prior to commencing work can be explained.

Criteria 18.4A.3.2

Faulty equipment, component or sub-assembly removed from system using appropriate engineering principles, tools, equipment and procedures.

Assessor guide: observe that –

The faulty component is removed from the system using appropriate tools, techniques and equipment in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for removing the faulty component can be given. The tools, techniques and equipment to be used in removing the faulty component can be identified. The reasons for selecting the chosen tools, techniques, equipment and procedures can be given.

Criteria 18.4A.3.3

Replaceable items selected from manufacturer's catalogues and obtained by appropriate means.

Assessor guide: observe that –

The relevant catalogues are obtained in accordance with workplace procedures. The appropriate replacement parts are obtained in accordance with standard operating procedures.

Assessor guide: confirm that –

The appropriate replacement parts can be identified. The procedures for obtaining replacement parts can be given.

Criteria 18.4A.3.4

Correct repair procedure, tools and equipment selected and prepared for use on serviceable items.

Assessor guide: observe that –

Assessor guide: confirm that –

Serviceable parts/items can be identified. The appropriate repair procedures can be identified. The tools, equipment and techniques to be used to repair the serviceable parts/items can be identified. The reasons for selecting the chosen repair procedure, tools, equipment and techniques can be given.

Criteria 18.4A.3.5

Using appropriate engineering principles, designated procedures, correct tools, equipment and safe workshop practices, serviceable items repaired or overhauled to manufacturer's or site specifications.

Assessor guide: observe that –

The serviceable items are repaired/ overhauled in conformance to specifications in accordance with standard operating procedures.

Assessor guide: confirm that –

The specifications of the serviceable parts/items can be identified.

Criteria 18.4A.3.6

Components checked with precision instruments to ensure conformance to specifications where applicable.

Assessor guide: observe that –

Where appropriate, repaired/ overhauled components are checked with precision instruments to ensure conformance to specifications.

Assessor guide: confirm that –

The precision measuring instruments to be used to check the repaired/overhauled components can be identified. The reasons for selecting the chosen precision measuring instruments and techniques can be given.

Element 18.4A.4 Fit and adjust mechanical equipment**Criteria 18.4A.4.0**

All electrical, safety and site requirements adhered to throughout maintenance cycle.

Assessor guide: observe that –

All relevant electrical, safety and site requirements are adhered to during the maintenance cycle.

Assessor guide: confirm that –

The electrical, safety and site requirements impacting on the maintenance to be carried out can be identified.

Criteria 18.4A.4.1

Fitting requirements determined and sequential assembly planning is carried out where applicable.

Assessor guide: observe that –

Assessor guide: confirm that –

The fitting requirements for assembling components can be identified. The appropriate sequence of assembly tasks can be determined and explained.

Criteria 18.4A.4.1

Maintenance report completed to standard operating procedures and conveyed to designated personnel.

Assessor guide: observe that –

The maintenance report is completed in accordance with standard operating procedures and conveyed to the appropriate person.

Assessor guide: confirm that –

The procedures for reporting/documenting maintenance undertaken/completed can be given. The person/authority to whom the report/documentation is to be given can be identified.

Criteria 18.4A.4.2

Sound fitting principles and techniques applied in the preparation and assembly of component parts using fastening equipment and methods which ensure conformance to specifications, operational performance, quality and safety.

Assessor guide: observe that –

Components are prepared and assembled using appropriate fitting techniques and principles.

Assessor guide: confirm that –

The requirements of the assembly in terms of specifications, operational performance, quality and safety can be identified. Examples of situations where other assembly techniques may be used can be given.

Criteria 18.4A.4.3

Using acceptable maintenance practices correct gland packing, jointing, gasket materials selected and applied correctly in conformance to specifications and operational requirements.

Assessor guide: observe that –

Where appropriate, gland packing, jointing or gasket materials are applied using acceptable engineering practices.

Assessor guide: confirm that –

The purpose of using gland packing, jointing or gasket materials can be explained. The reasons for selecting particular jointing or packing materials can be given. Examples of other applications of jointing and/or packing materials can be given.

Criteria 18.4A.4.4

Correct lubrication requirements determined by appropriate means and attended to where applicable using mechanical or manual applications.

Assessor guide: observe that –

Where appropriate, suitable lubricants are applied to the assembly using acceptable engineering practices.

Assessor guide: confirm that –

The applications of different types of lubricants can be identified. The consequences of using inappropriate or no lubricant can be explained.

Criteria 18.4A.4.5

Appropriate wedges and levelling devices used to level mechanical equipment as appropriate.

Assessor guide: observe that –

Where appropriate, suitable tools, techniques and equipment are used to level mechanical equipment.

Assessor guide: confirm that –

The procedures for levelling mechanical equipment can be given. The tools, techniques and equipment required to level mechanical equipment can be identified. The reasons for selecting the chosen tools, techniques and equipment can be given.

Criteria 18.4A.4.6

Correct alignment and balancing functions performed where appropriate.

Assessor guide: observe that –

Where appropriate, suitable alignment and balancing functions are performed on the mechanical equipment.

Assessor guide: confirm that –

The procedures for aligning and balancing mechanical equipment can be given. The tools, techniques and equipment required to carry out the aligning and balancing functions can be identified. The reasons for selecting the chosen tools, techniques and equipment can be given.

Criteria 18.4A.4.7

Final adjustments are performed on mechanical equipment to align to operational specifications using acceptable engineering principles, fitting techniques and procedures.

Assessor guide: observe that –

Components are checked for conformance to specifications. Where appropriate, components are adjusted to achieve conformance to specifications in accordance with standard operating procedures.

Assessor guide: confirm that –

The types of adjustment applicable to the components being assembled can be identified. The consequences of not adjusting the components to conform to specifications can be given. The procedures for adjusting the components can be given.

Criteria 18.4A.4.8

Mechanical equipment tested for accuracy and correct operation where applicable, and returned to service to specifications using acceptable procedures.

Assessor guide: observe that –

Where appropriate, the mechanical equipment is tested for accuracy and correct operation. The mechanical equipment is returned to service in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for testing the mechanical equipment for accuracy and correct operation can be given. The tools, techniques and equipment required to test the mechanical equipment can be given. The reasons for selecting the chosen tools, techniques and equipment can be given. The procedures for returning to service mechanical equipment can be given.

Criteria 18.4A.4.9

Appropriate work and safety clearances obtained throughout maintenance cycle.

Assessor guide: observe that –

All appropriate work and safety clearances are obtained during the maintenance cycle.

Assessor guide: confirm that –

The work and safety clearances to be obtained during the maintenance cycle can be identified. The reasons for obtaining work and safety clearances can be explained. The authority/person from whom work and safety clearances are to be obtained can be identified.

Range statement

This unit should be selected where an integrated level of skills in maintenance and overhaul of most types of mechanical equipment required. This unit is meant to build on skills covered by the specialist prerequisites. Where individual skills are required, specialist units should be selected. Work is undertaken autonomously or in a team environment using predetermined standards of safety, quality and workshop procedures. Where applicable all replacement items are selected from manufacturer's catalogues in conformance to specifications and operational requirements. Specifications interpreted from engineering drawings, detailed technical sketches and sources of technical data. Where extensive system knowledge for safe shut down/isolation of machinery/equipment is required see Unit 18.11A (Shut down/isolate machines/equipment).

Evidence guide

Assessment context

This unit should be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the maintenance and overhaul of mechanical equipment or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 18.5A A Bearings - fault diagnosis installation and removal

Band – Specialisation band A

Field – Maintenance & diagnostics

Unit Weight 4

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices

18.1A Use hand tools

18.6A Dismantle/repair/replace/assemble and fit engineering components

9.1A Draw and interpret sketch

18.2A Use power tools/hand held operations

18.55A Dismantle, replace and assemble engineering components

9.2A Interpret technical drawing

18.3A Use tools for precision work

Element 18.5A.1 Perform routine bearing checks during operation and non-operation

Criteria 18.5A.1.1

Bearing installation inspected and task requirements determined by most appropriate means.

Assessor guide: observe that –

The bearing installation is inspected.

Assessor guide: confirm that –

The work to be undertaken can be identified. The reasons for identifying the work to be undertaken can be given.

Criteria 18.5A.1.2

Bearing installation checked during operation using standard procedures of listening, feeling, observing and/or correct and appropriate test equipment.

Assessor guide: observe that –

The bearing installation is checked for signs of malfunction using appropriate techniques in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for checking bearings during operation using sensory means and test equipment can be given. The reasons for selecting the chosen techniques to check the bearing installation can be given.

Criteria 18.5A.1.3

Seal condition checked for seal and wear leaks using correct and appropriate means.

Assessor guide: observe that –

The bearing seals are checked for wear and leaks in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for checking bearing seals for leaks and wear can be given.

Criteria 18.5A.1.4

Lubricating devices checked for correct operation using correct and appropriate tools and techniques.

Assessor guide: observe that –

The lubricating devices are checked for correct operation using appropriate tools, equipment and techniques in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for checking lubricating devices for correct operation can be given. The tools, equipment and techniques to be used in checking lubricating devices can be identified.

Element 18.5A.2 Diagnose bearing faults**Criteria 18.5A.2.1**

Visual and sensory inspection of bearing arrangement performed.

Assessor guide: observe that –

Bearings are inspected using sensory techniques in accordance with standard operating procedures.

Assessor guide: confirm that –

Criteria 18.5A.2.2

Where appropriate, given manufacturer's specifications and diagnostic equipment, bearings tested for correct operation or malfunction using acceptable techniques, tools and procedures.

Assessor guide: observe that –

Where appropriate, the bearing installation is tested for correct operation or to determine malfunction in accordance with standard operating procedures.

Assessor guide: confirm that –

The equipment manufacturer's specifications can be identified.

Criteria 18.5A.2.3

Using appropriate knowledge of engineering principles, faulty bearings identified for replacement.

Assessor guide: observe that –

Faulty bearings are identified for replacement.

Assessor guide: confirm that –

The reasons for deciding to replace/not replace given bearings can be given. The timeframe in which the bearing should be replaced can be identified. Where appropriate, the need for further monitoring of the bearing can be identified. The reasons for deciding to replace the faulty bearing immediately or at the next scheduled machine down time can be explained.

Criteria 18.5A.2.4

Where appropriate, causes of failure identified using correct and appropriate techniques and equipment.

Assessor guide: observe that –

Where appropriate, the failed bearing is tested using appropriate tests, techniques and equipment in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for testing failed bearings can be given. Common causes of bearing failure and their indicators can be identified. The tools, techniques and equipment to be used to test failed bearings can be identified. The reasons for selecting the chosen tests, tools, techniques and equipment can be given. The cause(s) of the bearing failure can be identified.

Criteria 18.5A.2.5

Where appropriate corrective action taken to avoid recurrences.

Assessor guide: observe that –

Where appropriate, corrective action is undertaken to avoid a recurrence of bearing failure.

Assessor guide: confirm that –

The corrective action to be undertaken for given causes of bearing failure can be identified.

Element 18.5A.3 Identify bearing requirements for replacement or installation**Criteria 18.5A.3.1**

Bearing installation inspected and task requirements determined.

Assessor guide: observe that –

The bearing installation is inspected.

Assessor guide: confirm that –

The work to be undertaken can be identified. The reasons for identifying the work to be undertaken can be given.

Criteria 18.5A.3.2

Using appropriate knowledge of bearings and engineering principles, operational function of bearings to be installed or replaced is determined and understood.

Assessor guide: observe that –

Assessor guide: confirm that –

The application of a range of bearings can be identified. The operational function of each given bearing can be given. The mounting and lubricating requirements of each given bearing can be given.

Element 18.5A.4 Remove bearings**Criteria 18.5A.4.1**

Correct and appropriate bearing removal techniques and tools determined.

Assessor guide: observe that –

Assessor guide: confirm that –

The procedures for removing a range of bearings can be given. The tools, techniques and equipment to be used to remove given bearings can be identified. The reasons for minimising damage to shafts and housings during bearing removal can be explained.

Criteria 18.5A.4.2

Bearings removed from shafts or bearing housings using correct and appropriate technique, minimising damage to component.

Assessor guide: observe that –

Bearings are removed from shafts and/or bearing housings using the most appropriate technique in accordance with standard operating procedures.

Assessor guide: confirm that –

The type of bearing to be removed can be identified. The bearing removal procedure, tools, technique and equipment to be used can be identified. The reasons for selecting the chosen procedure, tools, technique and equipment can be given.

Criteria 18.5A.4.3

Condition of serviceable items such as shafts and housings inspected using correct and appropriate measuring and test equipment.

Assessor guide: observe that –

The shafts and housings are inspected using appropriate measuring and test equipment in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for measuring and testing shafts and housings can be given. The tools, equipment and techniques to be used to measure/test the shafts and housings can be identified. The reasons for selecting the chosen procedures, tests, tools, equipment and techniques can be given.

Criteria 18.5A.4.4

Serviceable items repaired using correct and appropriate engineering, techniques, tools and equipment.

Assessor guide: observe that –

Serviceable shafts and housings are repaired using appropriate tools, techniques and equipment in accordance with standard operating procedures.

Assessor guide: confirm that –

Serviceable shafts and housings can be identified. The reasons for deciding that shafts and housings are serviceable/ unserviceable can be given. The procedures, tools, techniques and equipment to be used to repair housings and shafts can be identified.

Element 18.5A.5 Install plain bearings**Criteria 18.5A.5.1**

Standard replaceable items for plain, wrapped, flanged, split bush and thrust bearings selected from manufacturer's parts lists, catalogues or engineering drawings.

Assessor guide: observe that –

All relevant parts lists, catalogues, drawings, etc. are obtained in accordance with workplace procedures.

Assessor guide: confirm that –

Replaceable items can be identified. The specifications of the replaceable items can be identified. The appropriate replaceable items for given situations can be identified. The reasons for selecting the chosen replaceable items can be given.

Criteria 18.5A.5.2

Correct and appropriate installation techniques and tools selected.

Assessor guide: observe that –

Assessor guide: confirm that –

The procedures for installing plain bearings can be given. The tools, techniques and equipment to be used to install plain bearings can be identified. The reasons for selecting the chosen tools, techniques and equipment can be given.

Criteria 18.5A.5.3

Bearing sized to correct clearance using correct and appropriate technique, tools and equipment.

Assessor guide: observe that –

Plain bearings are sized to the correct clearance using appropriate tools, techniques and equipment in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for determining the appropriate clearances for a range of plain bearings can be given. The procedures for "sizing" plain bearings can be given. The tools, techniques and equipment to be used to "size" the plain bearings can be identified. The reasons for selecting the chosen tools, techniques and equipment can be given.

Criteria 18.5A.5.4

Lubrication requirements catered for to meet specification and/or application requirements.

Assessor guide: observe that –

The plain bearing is lubricated in accordance with specifications and operational requirements.

Assessor guide: confirm that –

The lubrication requirements of given plain bearings can be identified.

Criteria 18.5A.5.5

Bearing fitted using correct and appropriate installation techniques, tools and equipment.

Assessor guide: observe that –

The bearing is installed using appropriate techniques, tools and equipment.

Assessor guide: confirm that –

The procedures for tensioning down plain bearings can be given.

Criteria 18.5A.5.6

Bearing tensioned down and run following standard operating procedures or manufacturer's recommendations.

Assessor guide: observe that –

Where appropriate, the bearing is tensioned down and run in accordance with standard operating procedures.

Assessor guide: confirm that –

The operational specifications of the plain bearing can be identified. The procedures for inspecting installed plain bearings can be given. The procedures for adjusting installed plain bearings to specification can be given.

Criteria 18.5A.5.7

Final clearance, adjustments and lubrication checked and correct and appropriate action taken where required.

Assessor guide: observe that –

The installed plain bearing is inspected for conformance to specifications using appropriate tools, techniques and equipment. Where appropriate, the plain bearing is adjusted to conform to specifications in accordance with standard operating procedures.

Assessor guide: confirm that –

The operational specifications of the plain bearing can be identified. The procedures for inspecting installed plain bearings can be given. The procedures for adjusting installed plain bearings to specification can be given.

Element 18.5A.6 Install anti-friction bearings**Criteria 18.5A.6.1**

Standard replaceable ball and roller anti-friction bearings selected from manufacturer's catalogues, spare parts lists or interpreted from engineering drawing to meet specifications.

Assessor guide: observe that –

All relevant parts lists, catalogues, drawings, etc. are obtained in accordance with workplace procedures.

Assessor guide: confirm that –

Replaceable anti-friction bearings can be identified. The specifications of the replaceable items can be identified. The appropriate replacement items for given situations can be identified. The reasons for selecting the chosen replacement items can be given.

Criteria 18.5A.6.2

Bearing inside/outside diameters determined from specifications or manufacturer's catalogue and checked using appropriate measuring instruments.

Assessor guide: observe that –

The inside and outside diameters of anti-friction bearings are measured accurately using appropriate measuring instruments.

Assessor guide: confirm that –

The appropriate instruments to measure bearing diameters can be identified. The reasons for selecting the chosen measuring instruments can be given.

Criteria 18.5A.6.3

Shafts and housings size checked for correct fit and clearances using appropriate measuring instruments.

Assessor guide: observe that –

Shafts and housings are measured accurately using appropriate measuring instruments.

Assessor guide: confirm that –

The sources of information with respect to shaft and housing fits and clearances can be identified. The shaft and housing diameters are checked for conformance to fit and clearance requirements.

Criteria 18.5A.6.4

Correct and appropriate installation techniques selected.

Assessor guide: observe that –

Assessor guide: confirm that –

The procedures for installing a range of anti-friction bearings can be given. The tools, equipment and techniques required to install given anti-friction bearings can be identified. The reasons for selecting the chosen installation technique, tools and equipment can be given.

Criteria 18.5A.6.5

Using appropriate engineering principles bearings fitted to shafts or housings using correct and appropriate tools, equipment, techniques to meet specifications.

Assessor guide: observe that –

Anti-friction bearings are fitted to shafts and housings using appropriate tools, techniques and equipment in accordance with standard operating procedures.

Assessor guide: confirm that –

Criteria 18.5A.6.6

Bearing sealed and capped where appropriate, to specifications.

Assessor guide: observe that –

Where appropriate, bearing seals and caps are installed in conformance with specifications and standard operating procedures.

Assessor guide: confirm that –

The procedures for installing bearing seals and caps can be given.

Range statement

Work undertaken autonomously using predetermined standards of quality, safety and workshop procedures involving the installation and replacement of plain, ball and roller bearings. Rotational plain bearings include plain bush, wrapped bush, flanged bush, split bush, self-lubricating and thrust bearings for radial, thrust and combination radial and thrust loading applications. Ball and roller bearings may include, but are not limited to, self-aligning ball bearings with cylindrical bore, taper bore (and adaptor sleeve), taper bore (and unthreaded adaptor sleeve); single row deep groove ball bearings, magneto bearings (separable ball bearings), single row angular contact ball bearings, double row angular contact ball bearings, spherical roller bearings, including narrow type and C design, spherical roller bearings (NV, N NS Type) double row cylindrical roller bearings, linear ball bearings, needle roller bearings, taper roller bearings, single thrust ball bearings, double thrust ball bearings, single thrust ball bearings with spherical housing washer and seating ring, spherical roller thrust bearings, radial bearings with cylindrical, tapered bore (and adaptor or withdrawal sleeve) and associated bearings for radial, axial and combination radial and axial applications. Tasks include routine bearing checks during operation, and non-operation bearing fault diagnostics, bearing removal, replacement, installation and lubrication using acceptable engineering principles, correct tools and equipment. Methods include the use of press, dowel, keys, keeper plate, heat, shrink and associated methods. The use of hydraulic and mechanical mounting and dismounting tools is included. All bearing replacements selected from spare parts lists, manufacturer's catalogues, engineering drawings and data sheets. All lubrication requirements attended to according to bearing manufacturer's specifications, standard operating procedures and lubricant supplier's instructions. Where no diagnostic skills are required and where straightforward removal and replacement of pre-manufactured bearings is undertaken, Unit 18.6A (Dismantle/repair/replace/assemble and fit engineering components) should be regarded as sufficient.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with fault diagnosis, installation and removal of bearings or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 18.6A A Dismantle/repair/replace/assemble and fit engineering components

Band – Specialisation band A

Field – Maintenance & diagnostics

Unit Weight 6

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices

18.1A Use hand tools

18.55A Dismantle, replace and assemble engineering components

9.1A Draw and interpret sketch

18.2A Use power tools/hand held operations

9.2A Interpret technical drawing

18.3A Use tools for precision work

Element 18.6A.1 Dismantle and inspect engineering components

Criteria 18.6A.1.1

Components are inspected and task requirements analysed.

Assessor guide: observe that –

Assessor guide: confirm that –

The tasks to be performed can be identified.

Criteria 18.6A.1.2

Components are clearly marked to aid in reassembly.

Assessor guide: observe that –

The component parts are appropriately marked for identification purposes using work site procedures.

Assessor guide: confirm that –

The reason for identifying parts can be explained.

Criteria 18.6A.1.3

Appropriate tools and equipment selected and component/s prepared for dismantling.

Assessor guide: observe that –

The component is prepared for dismantling using work site procedures.

Assessor guide: confirm that –

The tools and equipment to be used to dismantle the components can be identified. The reasons for selecting the tools and equipment can be given.

Criteria 18.6A.1.4

Components dismantled using appropriate engineering principles, techniques, procedures, tools and equipment.

Assessor guide: observe that –

The components are dismantled using work site procedures and appropriate techniques, tools and equipment.

Assessor guide: confirm that –

The reason for utilising the selected technique to dismantle the components can be given. Two examples of situations where other dismantling techniques may be selected can be given.

Criteria 18.6A.1.5

Operational specifications for components obtained from appropriate source and interpreted and understood.

Assessor guide: observe that –

Operational specifications for the component/s are obtained.

Assessor guide: confirm that –

An alternative source of the operational specifications can be identified. The specifications relevant to the components to be repaired/replaced can be identified.

Criteria 18.6A.1.6

Damaged or faulty components assessed against operational specifications.

Assessor guide: observe that –

The component/s are visually and dimensionally checked against the operational specifications using work site procedures.

Assessor guide: confirm that –

The consequences of having components that do not comply with operational specifications can be explained.

Criteria 18.6A.1.7

Faulty components identified for repair, replacement, adjustment or manufacture.

Assessor guide: observe that –

Where required the component parts that are to be repaired, replaced or manufactured are marked appropriately using work site procedures.

Assessor guide: confirm that –

The reason(s) for identifying parts for repair, replacement or manufacture can be given. Two examples of situations where parts would be identified for repair can be given. Two examples of situations where parts would be identified for replacement can be given. Two examples of situations where parts would be identified for manufacture can be given.

Element 18.6A.2 Repair/Replace faulty components**Criteria 18.6A.2.1**

Faulty components repaired or adjusted to conform to specifications.

Assessor guide: observe that –

Repaired components are visually and dimensionally checked for conformance to specifications. Components are adjusted to achieve conformance to specifications where appropriate.

Assessor guide: confirm that –

The types of adjustment applicable to the components being repaired/fitted can be identified. Two examples of the consequences of not adjusting components to conform to specifications can be given.

Criteria 18.6A.2.2

Method of repair determined as appropriate.

Assessor guide: observe that –

Assessor guide: confirm that –

Appropriate methods of repair can be identified.

Criteria 18.6A.2.3

Where applicable replacement parts selected from manufacturers' catalogue and assessed against specifications.

Assessor guide: observe that –

Replacement parts selected conform to specifications.

Assessor guide: confirm that –

The features and/or dimensions upon which replacement parts are to be selected can be identified. The process of identifying replacement parts from "third party" supplier's catalogues can be described.

Element 18.6A.3 Manufacture parts/components**Criteria 18.6A.3.1**

Parts/component specifications determined by most appropriate means.

Assessor guide: observe that –

Assessor guide: confirm that –

Three potential sources of parts/components specifications can be identified.

Criteria 18.6A.3.2

Materials selected to meet specification requirements.

Assessor guide: observe that –

Assessor guide: confirm that –

The material properties required can be identified. The reason for selecting particular material(s) can be explained.

Criteria 18.6A.3.3

Materials marked out according to specification using most appropriate tools, methods and equipment.

Assessor guide: observe that –

Where required, material is marked out to specification using work site procedures.

Assessor guide: confirm that –

The reasons for selecting the marking out method, tools and/or equipment used can be explained.

Criteria 18.6A.3.4

New components drilled, scraped, filed, reamed, tapped, threaded etc. in conformance to specifications using appropriate workshop practices.

Assessor guide: observe that –

Where required, appropriate manufacturing operations are performed using work site procedures.

Assessor guide: confirm that –

The manufacturing operations to be utilised in the production of new components can be identified. The sequence of operations to be used in the production of new components can be determined and explained.

Criteria 18.6A.3.5

Completed components inspected for compliance with dimensions.

Assessor guide: observe that –

Component parts are measured and checked against specifications.

Assessor guide: confirm that –

The consequences of component parts not complying with specifications can be explained.

Criteria 18.6A.3.6

Where appropriate, component parts are marked for identification prior to assembly.

Assessor guide: observe that –

The component parts are appropriately marked for identification purposes, where required.

Assessor guide: confirm that –

The reasons for identifying parts prior to assembly can be explained.

Element 18.6A.4 Fit engineering components into assemblies or subassemblies**Criteria 18.6A.4.1**

Fitting requirements and sequential assembly planning is carried out where applicable.

Assessor guide: observe that –

Assessor guide: confirm that –

The fitting requirements for assembling components can be identified. The appropriate sequence of assembly tasks can be determined and explained.

Criteria 18.6A.4.2

Appropriate fitting principles and techniques applied in the preparation and assembly of component parts using fastening equipment and methods which ensures conformance to specifications, operational performance, quality and safety.

Assessor guide: observe that –

Components are prepared and assembled using appropriate fitting techniques and principles.

Assessor guide: confirm that –

The requirements of the assembly in terms of specifications, operational performance, quality and safety can be identified. Two examples of situations where other assembly techniques may be used can be given.

Criteria 18.6A.4.3

Using acceptable engineering practices, correct gland packing, jointing/gasket materials selected and applied correctly in conformance to specifications and operational requirements.

Assessor guide: observe that –

Where appropriate, gland packing, jointing or gasket materials are applied, using acceptable engineering practices.

Assessor guide: confirm that –

The purpose of using gland packing, jointing or gasket materials can be explained. The reasons for selecting particular jointing or packing materials can be given. Two examples of other applications of jointing and/or packing materials can be given.

Criteria 18.6A.4.4

Correct lubrication requirements determined by appropriate means and attended to where applicable.

Assessor guide: observe that –

Appropriate lubricants are applied to the assembly using acceptable engineering practices, where required.

Assessor guide: confirm that –

The applications of different types of lubricants can be identified. The consequences of using inappropriate or no lubricant can be explained.

Criteria 18.6A.4.5

Final adjustments are performed on component assembly to meet operational specifications using acceptable engineering principles, fitting techniques and procedures.

Assessor guide: observe that –

Components are checked for conformance to specification. Where appropriate components are adjusted to achieve conformance to specifications.

Assessor guide: confirm that –

The types of adjustment applicable to the components being assembled can be identified. Two examples of the consequences of not adjusting components to conform to specification can be given.

Criteria 18.6A.4.6

Out of specification modification/alterations approved by appropriate authority, recorded and documented to standard operating procedure.

Assessor guide: observe that –

Where appropriate, any approved modifications/alterations are recorded to work site procedures.

Assessor guide: confirm that –

The reasons for modifying/altering components/assemblies to an out of specification situation can be given. The need to have approval for out of specification modifications can be explained. The reasons for documenting out of specification modifications can be given.

Criteria 18.6A.4.7

Final component assembly inspected for compliance to operational specifications and returned to service according to standard operating procedure.

Assessor guide: observe that –

The final assembly is inspected and conformance to operational specifications checked. Where appropriate the final assembly is returned to service in accordance with work site procedures.

Assessor guide: confirm that –

Return to service procedures can be identified. The consequences of not following work site return to service procedures can be explained.

Range statement

Work undertaken autonomously or in a team environment using predetermined standards of quality, safety and workshop procedures. This unit includes the fitting and maintenance of engineering components involving the dismantling, repair, replacement, assembling and final fitting of items, sub-assemblies and assemblies. All specifications interpreted from engineering drawings, detailed/technical sketches and associated data sheets. Tasks undertaken utilising engineering and maintenance principles, designated procedures, correct and appropriate tools, equipment and safe workshop practices. Where applicable replacement parts selected from manufacturer's catalogues in conformance with specifications and operational requirements. Appropriate fitting principles and techniques are utilised in the assembly of component parts using fastening equipment and methods which ensures conformance to specifications, operational performance, quality and safety. This includes the straight forward removal and replacement of pre-manufactured bearings and seals. Using acceptable maintenance procedures, appropriate lubrication, gland packing, jointing/gaskets, seals, materials are selected and applied in conformance to application requirements and specifications as applicable. Using acceptable workshop practices new components manufactured including by marking out, drilling, scraping, filing, reaming, tapping or threading to specifications. This unit does not address machining competencies and welding, if these are required, the appropriate units should also be accessed. Where additional or higher marking out skills are required, refer Unit 12.6A (Mark off/out (general engineering)). The knowledge and skills associated with the installation, removal, repair or replacement of mechanical seals is covered by Unit 18.12A (Mechanical seals - installation and removal). For high pressure fluid power seals see Unit 18.20A (Maintain hydraulic system components).

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the dismantling, repairing, replacing, assembling and fitting of engineering components, or other units requiring the exercise of the skills and knowledge covered by this unit. Competence in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, material and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any drawings, manuals, parts lists, catalogues and information relevant to the work. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

An individual would be expected to demonstrate competency in this unit at all times. The individual may be required to make judgements based on knowledge of the properties of engineering materials, surface finishes, tolerances, limits and fits, lubrication, seals, standard hardware items, bearings and standard engineering components. During assessment, the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with

standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures.

Unit MEM 18.7A A Maintain and repair mechanical drives and mechanical transmission assemblies

Band – Specialisation band A

Field – Maintenance & diagnostics

Unit Weight 4

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices

18.1A Use hand tools

18.6A Dismantle/repair/replace/assemble and fit engineering components

9.1A Draw and interpret sketch

18.2A Use power tools/hand held operations

18.9A Levelling and alignment of machines and engineering components

9.2A Interpret technical drawing

18.3A Use tools for precision work

18.55A Dismantle, replace and assemble engineering components

Element 18.7A.1 Undertake maintenance checks of mechanical drives and mechanical transmission components

Criteria 18.7A.1.1

Principles of mechanical drives and mechanical transmission components understood.

Assessor guide: observe that –

Assessor guide: confirm that –

The principles of operation of a range of mechanical drives and transmissions can be given.

Criteria 18.7A.1.2

The function of the main parts of the designated mechanical drive/transmission assembly understood.

Assessor guide: observe that –

Assessor guide: confirm that –

The function of the main components of a range of mechanical drives and transmissions can be given.

Criteria 18.7A.1.3

Using appropriate maintenance principles, techniques, tools and equipment, mechanical drive/transmission components checked for wear, distortion, tensions, misalignment, fatigue, lubrication, slackness, tooth wear, breakages and other related malfunctions.

Assessor guide: observe that –

Mechanical drives, transmissions and their components are checked for conformance to specification and malfunction using appropriate tools and equipment in accordance with standard operating procedures.

Assessor guide: confirm that –

Examples of common malfunctions in mechanical drives, transmissions and their components can be given. The procedures for checking mechanical drives, transmissions and their components for malfunction can be given. The tools, techniques and equipment required to check the mechanical drives, transmissions and their components for conformance to specification can be identified. The reasons for selecting the chosen tools, techniques and equipment can be given.

Criteria 18.7A.1.4

Assembly identified as requiring further diagnosis, repair or adjustment and findings documented by appropriate means.

Assessor guide: observe that –

The outcomes of the maintenance checks are documented in accordance with standard operating procedures.

Assessor guide: confirm that –

The mechanical drive/transmission is identified for further diagnosis, repair or adjustment. The reasons for deciding to repair, adjust or carry out further diagnosis can be explained. The procedures for documenting the outcomes of maintenance checks can be given.

Element 18.7A.2 Adjust mechanical drives and transmission assemblies**Criteria 18.7A.2.1**

Adjustment requirements determined by appropriate means.

Assessor guide: observe that –

Assessor guide: confirm that –

The extent of adjustment to be undertaken can be identified.

Criteria 18.7A.2.2

Adjustment method suitable for the type of drive or transmission assembly being serviced, determined from manufacturer's instruction sheets, standard workshop manuals/procedures or other appropriate means.

Assessor guide: observe that –

All relevant instructions, manuals, drawings, specifications, etc. are obtained in accordance with workplace procedures.

Assessor guide: confirm that –

The procedures for adjusting different types of drives and transmissions can be given. The method of adjustment to be applied to given situations can be identified. The reasons for selecting the chosen method of adjustment can be given.

Criteria 18.7A.2.3

Adjustment tools and equipment selected according to the type of assembly being serviced.

Assessor guide: observe that –

Assessor guide: confirm that –

The tools, equipment and techniques to be used to adjust a variety of mechanical drives and transmissions can be identified. The reasons for selecting the chosen tools, techniques and equipment can be given.

Criteria 18.7A.2.4

Using appropriate maintenance principles, techniques, tools and equipment, drives/transmission components tensioned, aligned balanced or adjusted to manufacturer's/site specifications according to safe workshop practices.

Assessor guide: observe that –

Mechanical drives and transmissions are adjusted in accordance with specifications and standard operating procedures.

Assessor guide: confirm that –

Criteria 18.7A.2.5

Drive/transmission assembly checked after adjustment for correct operation or identified for further diagnosis or repair.

Assessor guide: observe that –

Adjusted mechanical drives and transmissions are checked for correct operation and conformance to specification in accordance with standard operating procedures. Where appropriate, mechanical drives and transmissions are identified for further diagnosis or repair.

Assessor guide: confirm that –

The procedures for checking adjusted mechanical drives and transmissions can be given. The reasons for deciding to identify the mechanical drive or transmission for further repair or diagnosis can be given.

Criteria 18.7A.2.6

Service report completed.

Assessor guide: observe that –

The service report is completed in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for completing service reports can be given.

Criteria 18.7A.2.7

Further diagnosis or repair requirements actioned by appropriate means.

Assessor guide: observe that –

Where appropriate, further diagnosis or repair is carried out in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedure for referring mechanical drives and transmissions for further diagnosis or repair can be given.

Element 18.7A.3 Diagnose faults**Criteria 18.7A.3.1**

Service reports read and visual and sensory inspection of the drive/transmission assembly undertaken.

Assessor guide: observe that –

The mechanical drive/transmission is inspected for signs of malfunction.

Assessor guide: confirm that –

The service history of the mechanical drive/transmission can be identified.

Criteria 18.7A.3.2

Given manufacturer's specifications and where applicable diagnostic equipment drive/transmission assembly tested using sound maintenance principles and procedures.

Assessor guide: observe that –

The mechanical drive/transmission is tested using appropriate tools, techniques and equipment for conformance to operational specifications in accordance with standard operating procedures.

Assessor guide: confirm that –

The operational specifications of the mechanical drive/transmission can be identified. The procedures for carrying out diagnostic tests can be given. The diagnostic tests to be carried out can be identified. The appropriate tools, techniques and equipment required to carry out the tests can be identified. The reasons for selecting the chosen tests, tools, techniques and equipment can be given.

Criteria 18.7A.3.3

Faults localised at the component level and identified for repair or replacement.

Assessor guide: observe that –

The faulty component(s) are identified and marked for repair or replacement in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for marking components for repair or replacement can be given. The reasons for identifying components for repair or replacement can be given.

Criteria 18.7A.3.4

Fault causes analysed and preventative measures to avoid re-occurrence developed, documented and actioned by appropriate means.

Assessor guide: observe that –

The appropriate preventative measures to be undertaken are documented in accordance with standard operating procedures. Where appropriate, the preventative measures are initiated in accordance with standard operating procedures.

Assessor guide: confirm that –

The likely causes of the fault/ failure can be explained. The preventative measures to be undertaken to avoid recurrence of the fault/failure can be given. The procedures for documenting preventative measures to be undertaken can be given.

Criteria 18.7A.3.5

Requirements for repair or replacement actioned by appropriate means.

Assessor guide: observe that –

The appropriate repairs/replacements are initiated in accordance with standard operating procedures.

Assessor guide: confirm that –

Element 18.7A.4 Repair mechanical drives/transmission assemblies**Criteria 18.7A.4.1**

Service reports read and visual and sensory inspection of the drive/transmission assembly undertaken.

Assessor guide: observe that –

The mechanical drive/transmission to be repaired is inspected for signs of malfunction.

Assessor guide: confirm that –

The service history of the mechanical drive/transmission can be identified.

Criteria 18.7A.4.2

Task requirements ascertained.

Assessor guide: observe that –

Assessor guide: confirm that –

The work to be undertaken can be identified.

Criteria 18.7A.4.3

Tools and equipment selected according to the type of assembly being serviced.

Assessor guide: observe that –

Assessor guide: confirm that –

The tools, techniques and equipment to be used to service the mechanical drive/transmission can be identified. The reasons for selecting the chosen tools, techniques and equipment can be given.

Criteria 18.7A.4.4

Mechanical drive/transmission assembly dismantled using appropriate maintenance principles, techniques, tools, equipment and safe workshop practices.

Assessor guide: observe that –

The mechanical drive/transmission is dismantled using appropriate tools, techniques and equipment in accordance with standard operating procedures.

Assessor guide: confirm that –

Criteria 18.7A.4.5

Serviceable items repaired using appropriate maintenance procedures according to manufacturer's specifications and standard workshop practices.

Assessor guide: observe that –

Serviceable items are repaired using appropriate tools, techniques and equipment in accordance with standard operating procedures.

Assessor guide: confirm that –

Serviceable items can be identified.

Criteria 18.7A.4.6

Standard replaceable items selected using manufacturer's catalogues, spare parts lists, engineering specifications and obtained by appropriate means.

Assessor guide: observe that –

All relevant drawings, parts lists, specifications and manuals are obtained in accordance with workplace procedures.

Assessor guide: confirm that –

Replaceable items can be identified. Appropriate replacement parts are selected in accordance with specifications.

Criteria 18.7A.4.7

Component parts refitted to mechanical drive/transmission assembly using sound maintenance principles, techniques, tools and equipment in accordance with manufacturer's/site specifications.

Assessor guide: observe that –

The mechanical drive/transmission is reassembled using appropriate tools, techniques and equipment in accordance with standard operating procedures.

Assessor guide: confirm that –

Element 18.7A.5 Final adjustment and commissioning**Criteria 18.7A.5.1**

Using appropriate maintenance principles and procedures drive/transmission components tensioned, balanced, aligned or adjusted to suit specifications and operational requirements.

Assessor guide: observe that –

Mechanical drives and transmissions are adjusted in accordance with specifications and standard operating procedures.

Assessor guide: confirm that –

The tools, equipment and techniques to be used to adjust a variety of mechanical drives and transmissions can be identified. The reasons for selecting the chosen tools, techniques and equipment can be given.

Criteria 18.7A.5.2

Drive/transmission assembly checked after adjustment and operational performance analysed.

Assessor guide: observe that –

Adjusted mechanical drives and transmissions are checked for correct operation and conformance to specifications in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for checking adjusted mechanical drives and transmissions can be given.

Criteria 18.7A.5.3

Assembly commissioned on conformance to specifications.

Assessor guide: observe that –

The mechanical drive/transmission is commissioned in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for commissioning mechanical drives and transmissions can be given.

Criteria 18.7A.5.4

Service report completed by appropriate means.

Assessor guide: observe that –

The service report is completed in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for completing service reports can be given.

Range statement

Work undertaken autonomously or in a team environment using predetermined standards of quality, safety and workshop procedures involving the adjustment, repair, replacement of mechanical drives/transmission assemblies and associated components. Drive devices may include worm and worm wheel, line shafts, plumber blocks, pulleys, sprockets, belts, taper bush assemblies, roller chains, chain drives, mechanical and hydraulic couplings, compression couplings, disc type flexible couplings, spider type, chain couplings, universal joints, bevel gearing, rack and pinion gearing, dog toothed clutches, cone type clutches, expanding shoe type clutches, friction/plate type clutches, centrifugal clutches, toggle action linkages, magnetic clutches, sprag clutches, band type brakes and other associated drive components. Spare parts replacements selected from manufacturer's catalogues or engineering specifications. All adjustments, removal, repair, replacement and installation practices in conformance to safe workshop practices utilising appropriate maintenance principles, techniques, tools, equipment and procedures. Lubrication requirements attended to according to supplier's instructions and recommendations. Assemblies tested using appropriate methods for conformance to specifications and operational requirements. This unit should not be selected where either Unit 18.42A (Diagnose and repair manual transmissions) or Unit 18.44A (Diagnose and repair drive line and final drives) or Unit 18.43A (Diagnose and repair automatic transmissions) are also selected.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the maintenance and repair of mechanical drives and transmissions or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 18.8A A Balance equipment

Band – Specialisation band A

Field – Maintenance & diagnostics

Unit Weight 2

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices

18.1A Use hand tools

18.6A Dismantle/repair/replace/assemble and fit engineering components

9.1A Draw and interpret sketch

18.2A Use power tools/hand held operations

18.55A Dismantle, replace and assemble engineering components

9.2A Interpret technical drawing

18.3A Use tools for precision work

Element 18.8A.1 Check balance

Criteria 18.8A.1.1

Principles of equipment balance testing understood.

Assessor guide: observe that –

Assessor guide: confirm that –

The principles of balancing can be explained. The reasons for testing equipment for balance can be given. The effect of out of balance components on machine/equipment operation and life can be given.

Criteria 18.8A.1.2

Most appropriate balancing check procedure selected.

Assessor guide: observe that –

Assessor guide: confirm that –

Several procedures for checking the balance of equipment can be identified. The most appropriate procedure to be applied to selected balancing situations can be identified. The reasons for selecting the chosen balancing check procedure can be given.

Criteria 18.8A.1.3

Component set up correctly and to site/manufacturer's procedure for balance check.

Assessor guide: observe that –

The component to be balanced is set up in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for setting up the component to be balanced can be given.

Criteria 18.8A.1.4

Balance/out of balance determined and compared to specification requirements.

Assessor guide: observe that –

The balancing equipment is operated in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for operating the balancing equipment can be given. The specifications of the component to be balanced can be identified.

Criteria 18.8A.1.5

Out of balance readings recorded to prescribed procedures.

Assessor guide: observe that –

Out of balance readings are recorded in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for recording out of balance readings can be given.

Element 18.8A.2 Balance equipment**Criteria 18.8A.2.1**

Principles and methods of rigid and/or flexible rotation balancing understood.

Assessor guide: observe that –

Assessor guide: confirm that –

The principles of rigid and flexible rotation balancing can be explained. The methods of rigid and flexible rotation balancing can be described.

Criteria 18.8A.2.2

Techniques of single and/or multi-plane balancing used appropriate to application.

Assessor guide: observe that –

Assessor guide: confirm that –

The techniques of single and multiple plane balancing can be described. For given balancing situations the appropriate balancing technique can be identified. The reasons for selecting the chosen balancing technique can be given.

Criteria 18.8A.2.3

Equipment balanced utilising correct procedures.

Assessor guide: observe that –

Equipment is balanced using the appropriate techniques in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for balancing out of balance equipment can be given. The precautions to be taken when adding or removing material to achieve balance can be given.

Range statement

Work undertaken with minimum supervision or team environment. Equipment may range from static balancing devices to sophisticated electronic dynamic balancing machines. Work may be undertaken in the field, on-site or in a workshop environment. Balancing may include the addition or removal of material. All specifications for machine operation and degree of balance to be supplied. Wheel and tyre balancing is covered in Unit 18.38A (Maintain and repair wheels and tyres).

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the balancing of equipment or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 18.9A A Levelling and alignment of machines and engineering components

Band – Specialisation band A

Field – Maintenance & diagnostics

Unit Weight 4

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices

18.1A Use hand tools

18.6A Dismantle/repair/replace/assemble and fit engineering components

9.1A Draw and interpret sketch

18.2A Use power tools/hand held operations

18.55A Dismantle, replace and assemble engineering components

9.2A Interpret technical drawing

18.3A Use tools for precision work

Element 18.9A.1 Undertake levelling and alignment measurements/readings

Criteria 18.9A.1.1

Principles of levelling and alignment understood and utilised.

Assessor guide: observe that –

Assessor guide: confirm that –

The principles of levelling and alignment can be explained. The effects on equipment performance and life of non-level or out of alignment components can be given.

Criteria 18.9A.1.2

Task requirements determined by inspection of equipment to be levelled and/or components to be aligned.

Assessor guide: observe that –

The equipment to be levelled and/or components aligned are inspected.

Assessor guide: confirm that –

The tasks to be undertaken can be identified.

Criteria 18.9A.1.3

Correct appropriate levelling and/or alignment procedure selected.

Assessor guide: observe that –

Assessor guide: confirm that –

The procedures for levelling and aligning equipment/components can be given. The appropriate levelling and aligning procedures can be selected for given tasks. The reasons for selecting the chosen levelling and/or aligning procedures can be given.

Criteria 18.9A.1.4

Correct and appropriate levelling or alignment devices/equipment selected and set up to standard operating procedures or manufacturer's recommendation.

Assessor guide: observe that –

The appropriate levelling/aligning equipment is set up in accordance with standard operating procedures.

Assessor guide: confirm that –

The equipment, tools and techniques to be used to align/level the equipment/components can be identified. The reasons for selecting the chosen tools, techniques and equipment can be given. The procedures for setting up the levelling/aligning equipment can be given.

Criteria 18.9A.1.5

Measurements/readings taken accurately and recorded correctly to standard operating procedures.

Assessor guide: observe that –

All measurements are taken accurately and recorded in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for recording measurements taken can be given.

Element 18.9A.2 Perform levelling and/or alignment tasks**Criteria 18.9A.2.1**

Correct and appropriate engineering principles, techniques, tools and equipment selected.

Assessor guide: observe that –

Assessor guide: confirm that –

The appropriate techniques, tools, equipment and procedures to carry out the levelling and/or alignment tasks can be identified.

Criteria 18.9A.2.2

Levelling realignment calculations performed using correct and appropriate method for levelling/alignment application.

Assessor guide: observe that –

Assessor guide: confirm that –

The calculations to be performed to enable the equipment/components to be aligned/levelled can be identified.

Criteria 18.9A.2.3

Equipment levelled to specifications using correct and appropriate technique.

Assessor guide: observe that –

The equipment is levelled and/or aligned to specification using the appropriate techniques in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for levelling/aligning equipment/components can be given.

Criteria 18.9A.2.4

Levelling and alignment task completed to specifications.

Assessor guide: observe that –

The equipment/components are checked for conformance to specifications in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for checking equipment/components for conformance to specification for level and alignment can be given. The required measuring devices, tools and techniques can be identified.

Range statement

Work undertaken autonomously or in a team environment using predetermined standards of quality, safety and workshop procedures involving the levelling of equipment and the alignment of component parts. The use of appropriate engineering principles, techniques, tools and equipment is integral to all application tasks. Included is the use of a variety of tools and equipment not limited to: precision levels, spirit levels, line levels, optical levels, electronic levels, laser levels, dial indicators, special type dial indicator fixtures, magnetic bases, feeler gauges, bench centres, vee blocks, plumb and line, folding wedges, straight edges, shimpack materials, dumpy levels and other associated levelling and alignment equipment. Included is the setting up and use of alignment measuring devices and precision levelling devices. Level or out of alignment calculation performed using most appropriate means for the type of application being performed. Level and alignment specifications obtained from engineering drawings, data sheets or manufacturers specifications. All adjustments performed according to designated procedures in conformance to specifications.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the levelling and alignment of machines and engineering components or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 18.10A B Equipment condition monitoring and recording

Band – Specialisation band A

Field – Maintenance & diagnostics

Unit Weight 4

This unit covers the competencies required to undertake condition monitoring. This unit applies to specialist monitoring activities undertaken as a part of a preventative maintenance plan of program.

Note - This unit has dual status and is to be regarded as both a Specialisation band A unit and Specialisation band B unit for progression to C5 (AQF level V)

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices
18.1A Use hand tools

9.1A Draw and interpret sketch
18.2A Use power tools/hand held operations

9.2A Interpret technical drawing
18.55A Dismantle, replace and assemble engineering components

Element 18.10A.1 Undertake condition monitoring

Criteria 18.10A.1.1

Principles and methods of equipment condition monitoring understood and applied

Assessor guide: observe that –
Correct principals for monitoring are used and procedures followed

Assessor guide: confirm that –
Description of the application of principals and methods can be made for a variety of situations

Criteria 18.10A.1.2

Appropriate conditions monitoring technique selected to achieve required outcomes

Assessor guide: observe that –
Appropriate technique selected for the situation

Assessor guide: confirm that –

Criteria 18.10A.1.3

Checks undertaken correctly, safely and to standard operating procedures

Assessor guide: observe that –
Standard operating procedures are followed

Assessor guide: confirm that –

Criteria 18.10A.1.4

Results plotted and deviations from specification reported to appropriate authority/recorded

Assessor guide: observe that –
Results are properly recorded and deviation reports prepared and submitted

Assessor guide: confirm that –
Appropriate records can be identified for a variety of situations

Range statement

This unit applies where specialist monitoring activities are undertaken as part of a preventive maintenance or total productive maintenance plan or program. Work is undertaken autonomously or as part of a team environment. Techniques may include one or more of the following: built-in systems (software and site displays), vibration monitors, infra-red and ultraviolet non-destructive testing. Monitoring undertaken in workshop, laboratory or in situ environment; readings undertaken to the accuracy of monitoring equipment limitations or to site specifications where applicable. Results recorded/plotted to predetermined procedure and technique. All work and work procedures undertaken to standard operating procedures and/or equipment manufacturer's recommendations. All work and work practices undertaken to regulatory or legislative requirements. Where only routine maintenance checking and diagnostic skills are applied, other appropriate units should be accessed.

Evidence guide**Assessment context**

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with equipment condition monitoring and recording or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 18.11A B Shut down and isolate machines/equipment

Band – Specialisation band A

Field – Maintenance & diagnostics

Unit Weight 2

Notes - This unit has dual status and is to be regarded as both a Specialisation band A unit and Specialisation band B unit for progression to C7 (AQF level IV)

Element 18.11A.1 Shut down machine/equipment

Criteria 18.11A.1.1

Machine/equipment operational function determined and understood.

Assessor guide: observe that –

All relevant instructions, procedures and documentation is obtained in accordance with work place procedures.

Assessor guide: confirm that –

The operational function of the machine/equipment can be described.

Criteria 18.11A.1.2

Shut down sequence undertaken safely and to standard operating procedures.

Assessor guide: observe that –

The machine/equipment is shut down safely in accordance with standard operating procedures.

Assessor guide: confirm that –

The shut down sequence can be identified. The procedures for shutting down the machine/equipment can be given. The safety precautions to be taken when shutting down the machine/ equipment can be identified.

Criteria 18.11A.1.3

Machine/equipment depressurised/emptied/de-energised bled to standard operating procedures.

Assessor guide: observe that –

The machine/equipment is depressurised/emptied/de-energised/bled in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for depressurising/emptying/bleeding fluids from the machine/equipment can be given. The reasons for depressurising/emptying/bleeding fluids from the machine/equipment can be given.

Criteria 18.11A.1.4

Safe shut down of machine/equipment verified.

Assessor guide: observe that –

The safe shut down of the machine/equipment is verified in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for verifying machine/equipment shut down can be given. The reasons for verifying machine/equipment shut down can be given.

Criteria 18.11A.1.5

Safety/security lock off devices and signage installed to standard operating procedure.

Assessor guide: observe that –

All safety/security lock off devices and signage are installed in accordance with standard operating procedures.

Assessor guide: confirm that –

The safety/security lock off devices and signage to be installed can be identified. The reasons for installing lock off devices and signage can be explained. The procedures for installing lock off devices and signage can be given.

Criteria 18.11A.1.6

Machine/equipment left in clean and safe state.

Assessor guide: observe that –

The machine/equipment is left in a clean and safe state.

Assessor guide: confirm that –

The reasons for ensuring the machine/equipment is left in a clean, safe state can be given.

Element 18.11A.2 Isolate machine/equipment**Criteria 18.11A.2.1**

Machine/equipment operational function determined and understood.

Assessor guide: observe that –

All relevant instructions, procedures and documentation is obtained in accordance with work place procedures.

Assessor guide: confirm that –

The operational function of the machine/equipment can be described.

Criteria 18.11A.2.2

Isolation methods and points recognised and identified.

Assessor guide: observe that –

Assessor guide: confirm that –

The isolation methods and points for the machine/equipment can be identified.

Criteria 18.11A.2.3

Isolation undertaken safely and to standard operating procedures.

Assessor guide: observe that –

The machine/equipment is isolated in accordance with standard operating procedures.

Assessor guide: confirm that –

The isolation procedures for the machine/equipment can be given.

Criteria 18.11A.2.4

Safe isolation of machine/equipment verified.

Assessor guide: observe that –

The safe isolation of the machine/equipment is verified in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for verifying machine/equipment isolation can be given. The reasons for verifying machine/ equipment isolation can be given.

Criteria 18.11A.2.5

Safety/security lock off devices and signage installed to standard operating procedure.

Assessor guide: observe that –

All safety/security lock off devices and signage are installed in accordance with standard operating procedures.

Assessor guide: confirm that –

The safety/security lock off devices and signage to be installed can be identified. The reasons for installing lock off devices and signage can be explained. The procedures for installing lock off devices and signage can be given.

Criteria 18.11A.2.6

Machine/equipment left in clean and safe state.

Assessor guide: observe that –

The machine/equipment is left in a clean and safe state.

Assessor guide: confirm that –

The reasons for ensuring the machine/equipment is left in a clean, safe state can be given.

Range statement

Shut down/isolation undertaken autonomously or as part of team work. Machines/equipment range includes manual, semi automatic and automatic machines of a stand alone, continuous production or process nature. Shut down/isolation means and includes isolation of mechanical, electrical drives, pipework (pressure) rotating equipment etc. utilising electrical lock off isolators, mechanical and power driven valves etc. Relevant regulations, Australian Standards and legislative requirements governing isolation and shutdown complied with. This unit requires extensive system knowledge that excludes the straightforward starting/stopping of machinery/equipment through the use of simple switching, including use of emergency switches.

Evidence guide

Assessment context

This unit should be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the isolation and shut down of machines and equipment or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 18.12A A Mechanical seals - installation and removal

Band – Specialisation band A

Field – Maintenance & diagnostics

Unit Weight 2

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices

18.1A Use hand tools

9.1A Draw and interpret sketch

18.2A Use power tools/hand held operations

9.2A Interpret technical drawing

18.6A Dismantle/repair/replace/assemble and fit engineering components

18.55A Dismantle, replace and assemble engineering components

Element 18.12A.1 Determine mechanical seal requirements

Criteria 18.12A.1.1

Principles of mechanical seals understood.

Assessor guide: observe that –

Assessor guide: confirm that –

The principles of operation of mechanical seals can be explained. A range of applications of mechanical seals can be given.

Criteria 18.12A.1.2

Operational function of mechanical seal components understood.

Assessor guide: observe that –

Assessor guide: confirm that –

The essential components of a range of mechanical seal designs can be identified. The function of the essential components of mechanical seals can be explained.

Criteria 18.12A.1.3

For new mechanical seal installation, specifications interpreted from engineering drawings etc.

Assessor guide: observe that –

All relevant drawings, instructions, specifications and data are obtained in accordance with workplace procedures.

Assessor guide: confirm that –

The specifications of the mechanical seal to be installed can be identified. The procedures for installing new mechanical seals can be given.

Element 18.12A.2 Dismantle mechanical seal installations**Criteria 18.12A.2.1**

Mechanical seal assembly examined and correct and appropriate dismantling techniques, tools and equipment selected.

Assessor guide: observe that –

The mechanical seal assembly is examined in accordance with workshop procedures.

Assessor guide: confirm that –

The tools and equipment required to dismantle a mechanical seal assembly can be identified. The techniques for dismantling mechanical seal assemblies can be identified. The reasons for selecting the chosen tools, equipment and techniques can be explained.

Criteria 18.12A.2.2

Using correct and appropriate engineering techniques and safe workshop procedures mechanical seal assembly dismantled.

Assessor guide: observe that –

The mechanical seal assembly is dismantled in accordance with appropriate engineering techniques and safe workshop procedures.

Assessor guide: confirm that –

The hazards associated with the removal and dismantling of mechanical seals can be identified. The procedures for dismantling mechanical seal installations can be given.

Criteria 18.12A.2.3

All component parts examined for wear, including housing, shafts, primary sealing elements; secondary seals, seat assembly etc., to determine need for repair or replacement.

Assessor guide: observe that –

All mechanical seal components are examined for wear and checked for conformance to specifications. Where appropriate, mechanical seal components are marked for repair or replacement in accordance with workshop procedures.

Assessor guide: confirm that –

The failure patterns of mechanical seal components can be explained. Examples of worn or failed components can be identified. The mechanical seal components able to be repaired can be identified. The wear limits within which mechanical seal components are able to be repaired can be identified. The procedures for marking mechanical seal components for repair or replacement can be given.

Criteria 18.12A.2.4

Where applicable, serviceable items repaired by appropriate means.

Assessor guide: observe that –

Where appropriate, serviceable items are repaired using appropriate engineering techniques and safe workshop procedures.

Assessor guide: confirm that –

Criteria 18.12A.2.5

Primary sealing elements and secondary seals removed for replacement where required using correct and appropriate engineering techniques and tools.

Assessor guide: observe that –

Where appropriate, the primary sealing element and secondary seals are removed from the mechanical seal using appropriate techniques and tools in accordance with workshop procedures.

Assessor guide: confirm that –

The techniques for removing primary sealing elements and secondary seals from the mechanical seal can be identified. The tools required to remove primary sealing elements and secondary seals from the mechanical seal can be identified.

Element 18.12A.3 Select replaceable items**Criteria 18.12A.3.1**

Replaceable items selected using manufacturer's catalogues, spare parts lists, engineering specifications or sample, using standard operating procedures.

Assessor guide: observe that –

All relevant manufacturers' catalogues, spare parts lists, specifications are obtained in accordance with workplace procedures. Where appropriate, sample mechanical seals or components are obtained in accordance with workplace procedures.

Assessor guide: confirm that –

The specifications of the mechanical seal or component can be identified. The appropriate replacement mechanical seal or component can be identified. The procedures for identifying replacement items can be given. The reasons for selecting the chosen mechanical seal or component can be explained.

Element 18.12A.4 Reassemble mechanical seal installations**Criteria 18.12A.4.1**

Using correct and appropriate engineering techniques and tools, mechanical seal components fitted together including seal head, secondary seals, seat assembly, shaft and housing.

Assessor guide: observe that –

The mechanical seal components are fitted to the shaft and housing using appropriate tools and techniques in accordance with workshop procedures.

Assessor guide: confirm that –

The procedures to be followed when fitting mechanical seals can be identified. The tools and techniques to be used in the fitting of mechanical seals can be identified.

Criteria 18.12A.4.2

Mechanical seal assembly tensioned and adjusted to manufacturer's specifications.

Assessor guide: observe that –

The mechanical seal is adjusted and tensioned in accordance with manufacturer's specifications and workshop procedures.

Assessor guide: confirm that –

The manufacturer's specified mechanical seal tension can be identified. The procedures for adjusting mechanical seal tensions can be identified.

Criteria 18.12A.4.3

Mechanical seal assembly tested using appropriate methods for compliance with specifications and operational performance.

Assessor guide: observe that –

The mechanical seal assembly is tested for compliance with specifications and operational performance in accordance with workshop procedures.

Assessor guide: confirm that –

The procedures for testing mechanical seals can be identified. The operational specifications and requirements of the mechanical seal can be identified.

Range statement

Work undertaken autonomously using predetermined standards of quality, safety and workplace procedures. Tasks involve the checking, installation, removal and replacement of a range of mechanical seals including carbon, stellite, neoprene and other associated materials. Skills covered by this unit include the knowledge of appropriate applications for a range of mechanical seals and the ability to remove, select, repair or replace all component parts of the seal. All removal and installation practices to be undertaken in conformance to safe workplace practices and procedures, using correct tools and equipment. Seal replacements selected from manufacturer's catalogues, spare parts lists or engineering specifications. Included is the fitting of mechanical seals in new installations according to specifications interpreted from engineering drawings. Lubrication requirements attended to according to supplier's instructions and recommendations or specifications. Mechanical seal assembly tested using appropriate methods for compliance with specifications and operational performance. For straightforward replacement of seals, see Unit 18.55A (Dismantle, replace and assemble engineering components) or Unit 18.6A (Dismantle/repair/replace assemble and fit engineering components).

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the installation and removal of mechanical seals or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 18.13A A Gland packing

Band – Specialisation band A

Field – Maintenance & diagnostics

Unit Weight 2

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices

18.1A Use hand tools

Element 18.13A.1 Inspect glands and gland packing

Criteria 18.13A.1.1

Principles of gland packing understood.

Assessor guide: observe that –

Assessor guide: confirm that –

The principles of gland packing can be explained.

Criteria 18.13A.1.2

Stuffing box assembly and gland packing inspected and job requirements determined.

Assessor guide: observe that –

The stuffing box and gland packing are inspected in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for inspecting glands can be given. The tasks to be undertaken can be identified.

Element 18.13A.2 Remove gland packing

Criteria 18.13A.2.1

Using appropriate engineering techniques, tools and equipment, gland extracted or removed.

Assessor guide: observe that –

The gland packing is extracted/removed in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for removing gland packing can be given. The tools, techniques and equipment required to remove gland packing can be identified.

Element 18.13A.3 Replace or top up gland packing

Criteria 18.13A.3.1

Correct and appropriate gland packing selected and cut to size and shape to conform with application and/or specifications.

Assessor guide: observe that –

The appropriate gland packing is cut to size and shape in conformance with specifications and standard operating procedures.

Assessor guide: confirm that –

The various types of gland packing and their application can be identified. The appropriate gland packing for given situations can be identified. The reasons for selecting the chosen gland packing can be given. The gland packing specifications can be identified. The methods of cutting gland packing to size and shape can be given.

Criteria 18.13A.3.2

The stuffing box is filled with packing material and the gland is reassembled using standard operating procedures or manufacturer's recommended procedure.

Assessor guide: observe that –

The stuffing box is filled with packing material and reassembled in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for reassembling the gland can be given.

Range statement

Work undertaken autonomously using predetermined standards of quality, safety and workplace procedures. Tasks involve the packing and repacking of stuffing boxes and glands with correct and appropriate packing materials selected to meet application or from specifications or to manufacturer's requirements. Packing materials include, but are not limited, to carbon, hemp, rubber, leather, teflon, felt, neoprene. Packing types include, but are not limited to, ribbon flat, square, round, moulded, dry and lubricated. Applications include, but are not limited to, packing for: high or low temperatures and pressures, solids, gases, liquids. All packing tasks to be undertaken in conformance to safe workshop practices and procedures using correct tools and equipment. Packing materials selected from specifications, manufacturer's catalogues or to conform to operational requirements of the system being serviced. Packing techniques to be applied according to standard operating procedures/supplier's instructions and acceptable engineering principles. All work and work practices undertaken to regulatory and legislative requirements. Skills undertaken to maintain simple gland top-ups in non-critical applications and routine gland maintenance are covered by Unit 18.6A (Dismantle/repair/replace/assemble and fit engineering components).

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with gland packing or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 18.14A A Tool, gauge and die manufacture

Band – Specialisation band A

Field – Maintenance & diagnostics

Unit Weight 8

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices

2.13C5 Perform mathematical computations

7.6A Perform lathe operations

9.1A Draw and interpret sketch

12.6A Mark off/out (general engineering)

18.3A Use tools for precision work

18.55A Dismantle, replace and assemble engineering components

2.7C10 Perform computations - basic

6.7A Perform basic incidental heat/quenching, tempering and annealing

7.7A Perform milling operations

9.2A Interpret technical drawing

18.1A Use hand tools

18.6A Dismantle/repair/replace/assemble and fit engineering components

2.8C10 Perform computations

7.5A Perform general machining

7.8A Perform grinding operations

12.3A Precision mechanical measurement

18.2A Use power tools/hand held operations

18.15A Tool and die maintenance

Element 18.14A.1 Prepare to manufacture tool, gauge or die i.e. (tooling)

Criteria 18.14A.1.1

Determine tooling requirements from customer's components drawings, prints or sample component.

Assessor guide: observe that –

All relevant drawings, prints and/or sample components, specifications and instructions obtained in accordance with workplace procedures.

Assessor guide: confirm that –

The customer's tooling requirements are identified.

Criteria 18.14A.1.2

Tooling type and design conceptualised and planned with reference to customer's specifications (written or verbal) for numbers, finish, quality and material. Production machine to be used to produce components is assessed and comprehended in tooling design.

Assessor guide: observe that –

Assessor guide: confirm that –

The type of tooling to be manufactured can be identified. The machine(s) in which the tooling is to be used can be identified. The tooling design concept can be explained in terms of customer specifications and proposed production machine(s). The performance requirements of the tooling can be identified.

Criteria 18.14A.1.3

Tool design is interpreted and visualised from tooling drawings, prints or plan and checked against customer requirements.

Assessor guide: observe that –

Where appropriate, the tool design is sketched or drawn in accordance with relevant standards and workplace procedures. Where appropriate, tooling drawings are obtained in accordance with workplace procedures. The tooling drawings are checked for conformance to customer specifications and production requirements.

Assessor guide: confirm that –

Criteria 18.14A.1.4

Selected production machine mounting requirements determined to ensure any special or additional provisions are incorporated in tooling design.

Assessor guide: observe that –

Where appropriate, the mounting requirements of the tooling have been incorporated into the tooling design.

Assessor guide: confirm that –

The method of mounting the tooling in the production machine into which it is to be installed can be identified.

Element 18.14A.2 Manufacture tooling**Criteria 18.14A.2.1**

Appropriate materials selected and obtained to meet tooling requirements for strength, durability, component finish, heat treatment qualities where necessary and accounting for materials availability.

Assessor guide: observe that –

Assessor guide: confirm that –

The physical properties of a range of tool steels can be identified. The appropriate materials for each component of the tooling to be produced can be identified. The reasons for selecting the chosen materials can be explained in terms of: - strength - durability - component finish - heat treatment requirements - availability.

Criteria 18.14A.2.2

Selected material tested for hardness as appropriate to aid selection of machine tools, hand tools and hand held power tools to be used to fashion or shape tooling components.

Assessor guide: observe that –

Where appropriate, tooling materials are tested for hardness in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for hardness testing materials can be identified. The effect of material hardness on machinability of the material can be explained. The appropriate machinery and tools to be used to fashion or shape tooling components can be identified. The reasons for selecting the chosen machinery and tooling can be explained.

Criteria 18.14A.2.3

Plan developed to sequence and stage manufacturing process, including establish datum, mark out, rough out (machine or fashion), stress relieve/heat treat, finish size, fashion and fit, assemble componentry.

Assessor guide: observe that –

A sequential plan has been prepared for the manufacture of the required tooling and where appropriate, the plan is documented in accordance with standard operating procedures.

Assessor guide: confirm that –

The reasons for establishing a sequential plan for the manufacture of tooling can be given. Where appropriate, the procedures for documenting plans for the manufacture of tooling can be identified.

Element 18.14A.3 Perform machining operations**Criteria 18.14A.3.1**

Appropriate machines and machining process selected from a range of standard tool room machines to shape/produce tooling components to specifications.

Assessor guide: observe that –

The tooling components are shaped/ produced to specifications using appropriate machines and machining processes.

Assessor guide: confirm that –

The appropriate machines and machining processes to shape/produce the required tooling components can be identified. The reasons for selecting the chosen machines and machining processes can be given.

Element 18.14A.4 Use hand and hand held power tools**Criteria 18.14A.4.1**

A range of hand and hand held power tools are selected and used to fashion/manufacture tooling components to specification Where practical, components sample or section produced for testing.

Assessor guide: observe that –

The appropriate hand and hand held power tools are used to fashion/ manufacture tooling components to specification. Where appropriate, sample components or sections are utilised to test the tooling components being manufactured.

Assessor guide: confirm that –

The hand and hand held power tools to be used to fashion/manufacture the required tooling components can be identified. The reasons for selecting the chosen hand and hand held power tools can be given.

Element 18.14A.5 Assemble tooling components**Criteria 18.14A.5.1**

Using acceptable tool making techniques and procedures, components checked and fitted/assembled correctly to specifications.

Assessor guide: observe that –

All tooling components are assembled and fitted to specification, using acceptable tool making techniques and procedures.

Assessor guide: confirm that –

The procedures for fitting/ assembling the tooling components can be identified. The precautions to be taken when fitting/assembling tooling components can be given.

Element 18.14A.6 Trial tooling**Criteria 18.14A.6.1**

First-off component is checked with precision instruments against specification.

Assessor guide: observe that –

The first-off component/product is checked using appropriate precision instruments for conformance to specification.

Assessor guide: confirm that –

The appropriate precision instruments for checking the components produced can be identified. The specifications of the finished product can be identified.

Criteria 18.14A.6.2

Tooling is modified as necessary to produce components to specification.

Assessor guide: observe that –

Where appropriate, the tooling is modified using appropriate tool making techniques and procedures to ensure that the components/products produced comply with specifications.

Assessor guide: confirm that –

Where appropriate, the causes of any non-conformance to specification can be identified. Where appropriate the tool making techniques/procedures to be applied to return the tooling to specification can be identified.

Criteria 18.14A.6.3

Modified tooling is re-trialed and component produced
Conformance to specification is verified and reported
consistent with standard operating procedures.

Assessor guide: observe that –

Where appropriate, the first-off component/product produced by the modified tooling is checked using appropriate precision instruments for conformance to specification. The conformance of the component/ product to specification is reported/ recorded in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for reporting/ recording the conformance of the component/product produced by the tooling to specifications can be identified.

Criteria 18.14A.6.4

Where necessary all deviations or modifications to original tooling design, prints or plans recorded and reported consistent with standard operating procedures.

Assessor guide: observe that –

Where appropriate, modifications or alterations to original tooling design are recorded/reported in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for recording/reporting modifications and/or alterations to tooling design can be identified.

Range statement

Work undertaken autonomously or in a team environment; this unit is meant to cover skills required to manufacture and trial all types of production tooling. The tooling being produced may include, but not be limited to, the following types: press tools, jigs, fixtures, gauges, special purpose machines and equipment, forging dies, extruding dies, die casting (high & low pressure and gravity feed), plastic moulds (injection, compression, blow and foam) and glass moulds or dies requiring precision manufacture. A normal range of tool room equipment would be used which may include lathe, mills, copy/duplicator, grinders, EDM and wire cut equipment, precision measurement, hand and power tools. Where simple welding or brazing skills are required, see Unit 5.12A (Perform routine manual metal arc welding), Unit 5.50A (Perform routine gas metal arc welding) and Unit 5.6A (Perform brazing and/or silver soldering) as appropriate.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the manufacture of tools, gauges and dies or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 18.15A A Tool and die maintenance

Band – Specialisation band A

Field – Maintenance & diagnostics

Unit Weight 4

Notes - Where simple welding or brazing skills are required, see Unit 5.12A (Perform routine manual arc welding) and Unit 5.6A (Perform brazing and/or silver soldering).

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices

6.7A Perform basic incidental heat/quenching, tempering and annealing

7.5A Perform general machining

7.6A Perform lathe operations

7.7A Perform milling operations

7.8A Perform grinding operations

9.1A Draw and interpret sketch

9.2A Interpret technical drawing

12.3A Precision mechanical measurement

18.1A Use hand tools

18.2A Use power tools/hand held operations

18.3A Use tools for precision work

18.6A Dismantle/repair/replace/assemble and fit engineering components

18.55A Dismantle, replace and assemble engineering components

Element 18.15A.1 Identifies and analyses defects in tooling

Criteria 18.15A.1.1

Defects determined from any of the following: production components produced, production reports or tool inspections.

Assessor guide: observe that –

All relevant information with respect to defective tooling is obtained in accordance with workplace procedures. The defective tooling is examined for signs of breakage, wear, etc.

Assessor guide: confirm that –

Common tooling defects can be identified from a range of sample products/components. The probable causes of tooling failure can be identified. The reasons for selecting the probable causes of tooling failure can be explained.

Criteria 18.15A.1.2

Sequence of maintenance operations planned.

Assessor guide: observe that –

A sequential plan has been prepared for the repair/maintenance of the defective tooling and where appropriate, the plan is documented in accordance with standard operating procedures.

Assessor guide: confirm that –

The reasons for establishing a sequential plan for the repair/ maintenance of defective tooling can be given. Where appropriate, the procedures for documented plans for the repair/ maintenance of defective tooling can be identified.

Element 18.15A.2 Disassembles and assesses tooling components**Criteria 18.15A.2.1**

Disassemble tooling and assess condition of components against prints, drawings, manufacturer's drawings etc.

Assessor guide: observe that –

The defective tooling is disassembled in accordance with acceptable tool making techniques and procedures. All relevant drawings, specifications and sample products/components obtained in accordance with work place procedures. All tooling components are checked for conformance to specifications.

Assessor guide: confirm that –

The procedures for disassembling defective tooling can be identified. The specifications of all tooling components can be identified. The precision instruments to be used to check tooling components for conformance to specification can be identified. The reasons for selecting the chosen precision instruments can be explained.

Criteria 18.15A.2.2

Worn/damaged parts replaced/reconditioned.

Assessor guide: observe that –

Worn/damaged components are marked for repair or replacement in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for identifying worn/damaged tooling components for repair or replacement can be identified. The reasons for deciding to repair or replace worn/damaged components can be given.

Element 18.15A.3 Obtains and prepares replacement materials**Criteria 18.15A.3.1**

Materials obtained to meet tooling requirements.

Assessor guide: observe that –

Where appropriate, tooling components are tested for hardness in accordance with standard operating procedures. The appropriate materials are obtained for manufacture of replacement tooling components in accordance with standard operating procedures.

Assessor guide: confirm that –

The appropriate materials for each component of the tooling to be replaced can be identified. The required physical properties of the tooling to be replaced can be identified. The reasons for selecting the chosen materials can be explained in terms of: - strength - durability - component finish - heat treatment requirements - availability. The procedures for hardness testing materials can be identified.. The procedures for obtaining tooling materials can be identified.

Element 18.15A.4 Manufacture/repair tooling components

Criteria 18.15A.4.1

Appropriate hand and hand held power tools are selected and used.

Assessor guide: observe that –

The appropriate hand and handheld power tools are used to fashion/manufacture tooling components to specification. Where appropriate, sample components or sections are utilised to test the tooling components being manufactured.

Assessor guide: confirm that –

The hand and handheld power tools to be used to fashion/manufacture the required tooling components can be identified. The reasons for selecting the chosen hand and hand-held power tools can be given.

Criteria 18.15A.4.2

Appropriate machining process chosen from a range of standard tool room machines.

Assessor guide: observe that –

The tooling components are shaped/ produced to specifications using appropriate machines and machining processes.

Assessor guide: confirm that –

The appropriate machines and machining processes to shape/produce the required tooling components can be identified. The reasons for selecting the chosen machines and machining processes can be given.

Criteria 18.15A.4.3

Machining parameters set to produce components to specification.

Assessor guide: observe that –

Assessor guide: confirm that –

The effect of machining parameters on the surface finish and tolerances achievable from machining processes can be explained. The machining parameters appropriate to given machining tasks and specifications can be identified. The reasons for selecting the chosen machining parameters can be given.

Criteria 18.15A.4.4

Where appropriate heat treatment initiated according to specification.

Assessor guide: observe that –

Assessor guide: confirm that –

Where appropriate, the tool steel is heat treated in accordance with heat treatment procedures and specifications. Where appropriate, the heat treatment of tooling components initiated in accordance with standard operating procedures can be identified. The heat treatment requirements of a range of given tool steels to achieve specified hardness can be identified. The procedures for heat treating tool steels can be identified. Where appropriate, the procedures for initiating the heat treatment of tool steels can be identified.

Element 18.15A.5 Assemble tooling components**Criteria 18.15A.5.1**

Using acceptable tool making techniques and procedures, tooling components checked and assembled correctly in conformance with specifications.

Assessor guide: observe that –

All tooling components are assembled and fitted to specification using acceptable tool making techniques and procedures.

Assessor guide: confirm that –

The procedures for fitting/ assembling the tooling components can be identified. The precautions to be taken when fitting/assembling tooling components can be given.

Element 18.15A.6 Measure production components**Criteria 18.15A.6.1**

Production components are checked with precision instruments to ensure conformance to specifications as required.

Assessor guide: observe that –

The first-off component/product is checked using appropriate precision instruments for conformance to specification.

Assessor guide: confirm that –

The appropriate precision instruments for checking the components produced can be identified. The specifications of the finished product can be identified.

Element 18.15A.7 Identify potential production/maintenance problems**Criteria 18.15A.7.1**

Conditions leading to tooling failure identified and recorded.

Assessor guide: observe that –

Where appropriate, the conditions that lead to the failure of the given set of tooling are recorded in accordance with standard operating procedures.

Assessor guide: confirm that –

The common causes of tooling failure can be identified. The procedures for documenting tooling failures can be identified. The conditions leading to the failure of a given set of tooling can be identified. The reasons for selecting the chosen mode of failure can be explained.

Criteria 18.15A.7.2

Recurrent faults identified and solutions initiated.

Assessor guide: observe that –

Where appropriate, design modifications/alterations to rectify recurring faults or failure trends are initiated in accordance with standard operating procedures.

Assessor guide: confirm that –

Where appropriate, previous faults with the given set of tooling can be identified. Where appropriate, any commonalities of causes of failures or trends/events associated with tooling failure can be identified. Appropriate solutions can be proposed for a range of recurrent faults that may occur in tooling. The reasons for selecting the chosen solutions can be explained. The procedures for initiating modifications/alterations to tooling design can be identified.

Range statement

This standard may be applied in a tool room situation which involves a great deal of autonomy based on a sound knowledge of the operation of production tooling. The tooling being maintained may include any of the following: press tools, plastic moulds, forging dies, die casting, or jigs and fixtures, gauges etc. requiring precision repair. For simple maintenance not requiring precision repair, see Unit 18.6A (Dismantle/repair/replace/assemble and fit engineering components). Normal range of tool room equipment would be used which may include lathes, mills, grinders, hand and power tools used for precision work.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the maintenance of tools and dies or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 18.16B A Analyse plant and equipment condition monitoring results

Band – Specialisation band B

Field – Maintenance & diagnostics

Unit Weight 4

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices

2.14C5 Use graphical techniques and perform simple statistical computations

12.3A Precision mechanical measurement

18.3A Use tools for precision work

18.55A Dismantle, replace and assemble engineering components

2.7C10 Perform computations - basic

9.1A Draw and interpret sketch

18.1A Use hand tools

18.6A Dismantle/repair/replace/assemble and fit engineering components

2.8C10 Perform computations

9.2A Interpret technical drawing

18.2A Use power tools/hand held operations

18.10A Equipment condition monitoring and recording

Element 18.16B.1 Analyse condition monitoring results

Criteria 18.16B.1.1

Records/graphs/results of condition monitoring examined, analysed and problem areas identified.

Assessor guide: observe that –

The results of condition monitoring of plant/equipment are obtained in accordance with workplace procedures.

Assessor guide: confirm that –

The operational specifications of the plant/equipment being monitored can be identified. Any trends and/or deviations from operational specifications can be identified.

Criteria 18.16B.1.2

Necessary calculations/computations undertaken.

Assessor guide: observe that –

The appropriate calculations are performed using the condition monitoring data collected.

Assessor guide: confirm that –

The calculations to be applied to condition monitoring results to enable the collected data to be analysed can be identified. The reasons for undertaking the identified calculations can be given.

Criteria 18.16B.1.3

Appropriate reports/determinations of analyses undertaken to prescribed site procedure.

Assessor guide: observe that –

Reports based on the analysis of the condition monitoring data are prepared in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for reporting the analysis of condition monitoring data can be given.

Element 18.16B.2 Develop recommendations**Criteria 18.16B.2.1**

Recommendations developed based on previous history, results, specifications, legislative requirements.

Assessor guide: observe that –

Assessor guide: confirm that –

The previous history of the plant/equipment being monitored can be identified. Any relevant legislative requirements can be identified. The operational specifications of the plant/equipment can be identified. The recommendations with respect to action to be taken can be identified. The reasons for the recommendations made can be given. The expected effect of the recommendations on the operational performance of the plant/equipment can be given.

Criteria 18.16B.2.2

Report recommendations to appropriate authority.

Assessor guide: observe that –

The recommendations are reported to the appropriate authority.

Assessor guide: confirm that –

The procedures for reporting recommendations can be given. The authority/person to whom the recommendations are to be made can be identified.

Range statement

Analysis/recommendations undertaken autonomously. This unit is intended to apply to the analysis of data generated by a continuous plant and equipment condition monitoring program. The analysis of condition monitoring and production of recommendations is undertaken autonomously. Recommendations may be in writing or verbal. If production of formal reports is required, then appropriate communication units should be accessed.

Evidence guide

Assessment context

This unit should be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the analysis of plant and equipment monitoring results or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 18.17B B Modify mechanical systems and equipment

Band – Specialisation band B

Field – Maintenance & diagnostics

Unit Weight 8

This unit covers the competencies required to determine the requirements of the modification, undertake the modification and evaluate the modified mechanical system/equipment. Modifications covered by this unit are changes to plant and equipment which lead to desired changes in performance of the system or equipment.

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices

2.14C5 Use graphical techniques and perform simple statistical computations

12.3A Precision mechanical measurement

18.3A Use tools for precision work

18.7A Maintain and repair mechanical drives and mechanical transmission assemblies

18.11A Shut down and isolate machines/equipment

2.7C10 Perform computations - basic

9.1A Draw and interpret sketch

18.1A Use hand tools

18.5A Bearings - fault diagnosis installation and removal

18.9A Levelling and alignment of machines and engineering components

18.16B Analyse plant and equipment condition monitoring results

2.8C10 Perform computations

9.2A Interpret technical drawing

18.2A Use power tools/hand held operations

18.6A Dismantle/repair/replace/assemble and fit engineering components

18.10A Equipment condition monitoring and recording

18.55A Dismantle, replace and assemble engineering components

Element 18.17B.1 Determine modification requirements

Criteria 18.17B.1.1

Maintenance reports and system output information analysed

Assessor guide: observe that –

All relevant maintenance reports, production data, drawings, circuits, condition monitoring data, specifications, instructions, etc. are obtained in accordance with work place procedures

Assessor guide: confirm that –

The desired changes in performance of the plant/equipment can be identified

Criteria 18.17B.1.2

Defective components, sub-assemblies and design faults identified

Assessor guide: observe that –

The plant/equipment is inspected for correct location, alignment, operation, performance and conformance to specifications using appropriate maintenance techniques and procedures

Assessor guide: confirm that –

The specifications of the plant/ equipment and its performance requirements can be identified The procedures for inspecting the plant/equipment against specifications can be given Where appropriate, defective components, sub-assemblies and design faults can be identified The effect of defective components, sub-assemblies and design faults on the performance of plant/equipment can be explained

Criteria 18.17B.1.3

Corrective action plan developed

Assessor guide: observe that –

The planned modifications are documented and approved in conformance to standard operating procedures

Assessor guide: confirm that –

The action to be taken to achieve the desired changes in performance can be identified The reasons for taking the action identified can be explained The procedures for documenting the proposed modifications to the plant/equipment can be identified The authority from whom approval to undertake the proposed modifications is to be obtained can be identified

Element 18.17B.2 Undertake standard modifications to mechanical systems and equipment**Criteria 18.17B.2.1**

Modification options for overcoming parts failures, design faults identified

*Assessor guide: observe that –**Assessor guide: confirm that –*

Typical part failure modes can be identified The causes of those part failures can be given The action to be taken to correct part failures and design faults can be explained For given part failures and/or design faults, the options for modifying the plant/equipment can be identified and explained

Criteria 18.17B.2.2

Failed components, sub-assembly replacements selected from manufacturer's catalogue

*Assessor guide: observe that –**Assessor guide: confirm that –*

For given components and/or sub-assemblies, appropriate standard replacements can be identified from manufacturers'/suppliers' catalogues

Criteria 18.17B.2.3

Modification designs developed in conjunction with, and approved by appropriate authority

Assessor guide: observe that –

Where appropriate, drawings of the modified components and/or sub-assemblies are prepared and authorised in accordance with standard operating procedures

Assessor guide: confirm that –

The procedures for modifying drawings of components and/or sub-assemblies can be identified The procedures for authorising changes made to drawings of plant/ equipment can be identified

Criteria 18.17B.2.4

Modification recorded to standard operating procedure

Assessor guide: observe that –

The approved modifications undertaken are recorded in accordance with standard operating procedures

Assessor guide: confirm that –

The procedures for recording modifications undertaken can be identified

Element 18.17B.3 Evaluate modified mechanical system/equipment**Criteria 18.17B.3.1**

Alterations evaluated for effectiveness and efficiency

Assessor guide: observe that –

The modified plant/equipment is operated and its performance monitored to ensure conformance with the required performance specifications

Assessor guide: confirm that –

The procedures for checking the operation of the modified plant/ equipment against required performance specifications can be explained The effectiveness/efficiency of the modifications can be identified

Criteria 18.17B.3.2

Effectiveness/efficiency reported and recorded

Assessor guide: observe that –

Where appropriate, the efficiency/ effectiveness of the modifications undertaken are reported/recorded in accordance with standard operating procedures

Assessor guide: confirm that –

The procedures for reporting/ recording the effectiveness/ efficiency of the modifications in achieving the desired performance can be identified

Criteria 18.17B.3.3

Results checked against specifications

*Assessor guide: observe that –**Assessor guide: confirm that –*

The tests to be undertaken to check the performance of the modified plant/equipment can be identified The test results have been compared with the specification of the modified plant/equipment

Criteria 18.17B.3.4

Additional modification/changes if required, recommended

Assessor guide: observe that –

Where appropriate, further modifications to the plant/equipment are recommended in accordance with standard operating procedures

Assessor guide: confirm that –

Where appropriate, the need for further modifications to the plant/ equipment can be explained in terms of the effect of the modifications undertaken on the plant/equipment and the required performance specifications

Range statement

Modifications covered by this unit are changes to plant and equipment which lead to desired changes in performance. Maintenance schedules are required for mechanical machines and systems, including stationary, stand-alone machines, and manual, semi-automatic and automatic process systems. Work is undertaken autonomously or in a team environment.

Analysis functions include interpretation and integration of data from process control instrumentation and condition monitoring systems. Modifications include approved minor design changes and/or replacement of components or sub-assemblies using equivalent parts listed in manufacturer's catalogue. This unit applies to existing equipment or the installation of new or replacement equipment. Where drafting skills to Australian Standard 1100 are required, see Unit 9.3A (Prepare basic engineering drawing).

Evidence guide**Assessment context**

This unit should be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the modification of mechanical systems and equipment or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 18.18A B Maintain pneumatic system components

Band – Specialisation band A

Field – Maintenance & diagnostics

Unit Weight 4

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices

18.1A Use hand tools

18.6A Dismantle/repair/replace/assemble and fit engineering components

9.1A Draw and interpret sketch

18.2A Use power tools/hand held operations

18.55A Dismantle, replace and assemble engineering components

9.2A Interpret technical drawing

18.3A Use tools for precision work

Element 18.18A.1 Check pneumatic system components

Criteria 18.18A.1.1

System components identified correctly.

Assessor guide: observe that –

Assessor guide: confirm that –

The full range of pneumatic system components can be identified.

Criteria 18.18A.1.2

The characteristics and operational function of each system component are understood.

Assessor guide: observe that –

Assessor guide: confirm that –

The characteristics and operational function of each pneumatic system component can be identified.

Criteria 18.18A.1.3

The operational function of each component inspected and tested.

Assessor guide: observe that –

A range of pneumatic system components are inspected and tested in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for inspecting and testing pneumatic system components can be identified. The equipment required to test pneumatic system components can be identified.

Criteria 18.18A.1.4

Correct operation of each component assessed against specifications.

Assessor guide: observe that –

All relevant data sheets and specifications are obtained in accordance with standard operating procedures.

Assessor guide: confirm that –

The specifications of each pneumatic system component can be identified. Pneumatic components not operating in accordance with specifications can be identified. The reason for pneumatic components not operating in accordance with specification can be given.

Element 18.18A.2 Identify, repair/replace faulty pneumatic system components

Criteria 18.18A.2.1

Faulty system components localised and malfunction confirmed by inspection and testing using fluid power principles, procedures and safety requirements.

Assessor guide: observe that –

All relevant pneumatic circuits, drawings, instructions, manuals and data sheets obtained in accordance with workplace procedures. The individual components within the pneumatic system are checked for correct operation in accordance with standard operating procedures.

Assessor guide: confirm that –

The individual components within the pneumatic system can be identified. The safety procedures to be followed when working on pneumatic components can be identified. Where appropriate, faulty system components can be identified.

Criteria 18.18A.2.2

Faulty system components dismantled and repaired to manufacturer's/site specifications.

Assessor guide: observe that –

Faulty system components are dismantled and repaired to manufacturer's/site specifications in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedure for repairing pneumatic system components can be identified.

Criteria 18.18A.2.3

Replacement parts selected from manufacturer's catalogue according to required specifications.

Assessor guide: observe that –

Where appropriate, replacement parts are selected from the manufacturers'/suppliers' catalogues in conformance with specifications.

Assessor guide: confirm that –

The parts to be replaced can be identified. The reasons for replacing the parts identified can be given.

Criteria 18.18A.2.4

System components reassembled and tested for correct operation assessed against specifications.

Assessor guide: observe that –

The pneumatic system components are reassembled in accordance with standard operating procedures. The pneumatic components are tested for correct operation and conformance to specifications in accordance with standard operating procedures.

Assessor guide: confirm that –

Criteria 18.18A.2.5

Correct operation of the pneumatic system confirmed to standard operating procedure.

Assessor guide: observe that –

The operation of the pneumatic system is checked for conformance to specification in accordance with standard operating procedures.

Assessor guide: confirm that –

The correct operation of the pneumatic system can be identified. The procedures for checking pneumatic system operation can be given.

Criteria 18.18A.2.6

Appropriate follow up procedures adopted according to standard operating procedure.

Assessor guide: observe that –

Where appropriate, repaired/replaced pneumatic system components are checked for correct operation in accordance with standard follow up procedures.

Assessor guide: confirm that –

Where appropriate, the follow up procedures with respect to repaired/replaced pneumatic system components can be identified.

Criteria 18.18A.2.7

Where appropriate, service reports completed using standard operating procedures.

Assessor guide: observe that –

Where appropriate, service reports are completed in accordance with standard operating procedures.

Assessor guide: confirm that –

The reporting/recording procedures can be identified.
The reasons for completing service reports for pneumatic systems components repaired/replaced can be explained.

Range statement

Work undertaken using predetermined standards of safety, quality and work procedures. Pneumatic system components identified, inspected and assessed using fluid power principles to predetermined specifications interpreted from data sheets and circuit diagrams. Repairs and replacements to site or manufacturers specifications. Pneumatic system components may include high pressure seals, linear, rotary actuators, directional control valves, proportional valves, timers, counters, sensors, pneumatic motors, pressure control valves, lines, hoses and other associated equipment. Correct operational function of equipment components confirmed and commissioned in conformance to specification, using standard operating procedures. For straightforward removal/replacement of components from a pneumatic system, see Unit 18.55A (Dismantle replace and assemble engineering components).

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the maintenance of pneumatic system components or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 18.19A A Maintain and repair pneumatic systems

Band – Specialisation band A

Field – Maintenance & diagnostics

Unit Weight 4

Notes - This unit has dual status and is to be regarded as both a Specialisation band A unit and Specialisation band B unit for progression to C5 (AQF level V)

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices

9.1A Draw and interpret sketch

9.2A Interpret technical drawing

18.1A Use hand tools

18.2A Use power tools/hand held operations

18.3A Use tools for precision work

18.6A Dismantle/repair/replace/assemble and fit engineering components

18.18A Maintain pneumatic system components

18.55A Dismantle, replace and assemble engineering components

Element 18.19A.1 Undertake preventative maintenance checks/adjustments on pneumatic systems

Criteria 18.19A.1.1

System components, assemblies or sub-assemblies are identified and prepared for inspection/preventative maintenance.

Assessor guide: observe that –

Pneumatic system components are prepared for inspection/preventative maintenance in accordance with work site procedures.

Assessor guide: confirm that –

Common pneumatic system components can be identified.

Criteria 18.19A.1.2

Visual inspection and testing with appropriate test equipment is carried out according to fluid power principles, procedures and safety requirements.

Assessor guide: observe that –

The pneumatic system and its components are inspected and tested safely in accordance with work site procedures.

Assessor guide: confirm that –

Pneumatic system/component faults that can be determined by visual inspection can be identified. The application of common pneumatic system/component test equipment can be given.

Criteria 18.19A.1.3

Scheduled preventative maintenance tasks are performed including obvious repairs and adjustments according to manufacturer's specification using fluid power techniques/practices.

Assessor guide: observe that –

Scheduled preventative maintenance tasks are performed in accordance with work site procedures. Where appropriate, obvious repairs are performed on the pneumatic system/components in accordance with work site procedures. Where appropriate, pneumatic system/components are adjusted to return the system to manufacturer's specification in accordance with work site procedures.

Assessor guide: confirm that –

Scheduled preventative maintenance tasks can be identified. The manufacturer's specifications can be identified.

Element 18.19A.2 Undertake fault finding on pneumatic systems

Criteria 18.19A.2.1

Designated pneumatic system components are identified and a visual inspection of the system is carried out for the collection of fault finding data.

Assessor guide: observe that –

The pneumatic system and its components are visually inspected for indications of correct/incorrect operation in accordance with work site procedures.

Assessor guide: confirm that –

Common pneumatic system and component faults can be identified.

Criteria 18.19A.2.2

System operator consulted where appropriate and additional data collected.

Assessor guide: observe that –

Where appropriate, the system operator is consulted with respect to the fault being investigated.

Assessor guide: confirm that –

Criteria 18.19A.2.3

Maintenance reports and preventative maintenance schedules checked and reviewed for additional fault finding data.

Assessor guide: observe that –

Maintenance reports and preventative maintenance schedules are obtained in accordance with work site procedures.

Assessor guide: confirm that –

Any previous faults in the pneumatic system/components can be identified. Any previous maintenance carried out on the pneumatic system/components can be identified.

Criteria 18.19A.2.4

Using fluid power principles checks and tests are undertaken using appropriate test equipment and techniques.

Assessor guide: observe that –

Appropriate test equipment and techniques are used to check/test pneumatic system/component operation in accordance with work site procedures.

Assessor guide: confirm that –

Typical checks/tests that can be carried out on pneumatic systems/components and their application can be identified. Pneumatic system/component tests and testing techniques can be identified.

Criteria 18.19A.2.5

Faults and malfunctions are identified and verified.

Assessor guide: observe that –

Apparent faults/malfunctions are verified/confirmed in accordance with work site procedures.

Assessor guide: confirm that –

Apparent faults/malfunctions can be identified.

Criteria 18.19A.2.6

Faults and malfunctions documented or reported by appropriate means to designated personnel and actioned.

Assessor guide: observe that –

All verified faults/malfunctions are documented or reported in accordance with work site procedures. The repair/overhaul of the pneumatic system is initiated in accordance with work site procedures.

Assessor guide: confirm that –

The documentation/reporting requirements with respect to verified faults/malfunctions can be identified. The procedures for initiating repair and/or overhaul of the pneumatic system can be identified.

Element 18.19A.3 Repair and/or overhaul pneumatic power system**Criteria 18.19A.3.1**

System or sub-assembly isolated safely and residue pressure discharged in accordance with prescribed procedures or checked for correct isolation.

Assessor guide: observe that –

The pneumatic system is isolated and depressurised safely in accordance with work site procedures. The pneumatic system is checked to ensure isolation and depressurisation in accordance with work site procedures.

Assessor guide: confirm that –

The hazards associated with working on pneumatic systems/components can be identified. The procedures for isolating and depressurising pneumatic systems can be identified.

Criteria 18.19A.3.2

Isolated system or sub-assembly tagged according to designated means.

Assessor guide: observe that –

The isolated pneumatic system is tagged in accordance with work site procedures.

Assessor guide: confirm that –

The tagging requirements for isolated systems can be identified.

Criteria 18.19A.3.3

Component or sub-assembly removed from system using correct removal principles and techniques.

Assessor guide: observe that –

The pneumatic components/sub-assembly are removed from the system in accordance with work site procedures.

Assessor guide: confirm that –

Criteria 18.19A.3.4

Components or sub-assemblies dismantled, examined and verified for replacement, overhaul or repair, using correct and appropriate techniques and procedures.

Assessor guide: observe that –

The pneumatic components/sub-assemblies are dismantled in accordance with work site procedures. The pneumatic components/sub-assemblies and their parts are examined for conformance to specification. Components outside specification and not repairable are marked for replacement in accordance with work site procedures. Components outside specification and able to be returned to specification are marked for repair/overhaul in accordance with work site procedures.

Assessor guide: confirm that –

The structure of typical pneumatic components can be identified. The specifications of pneumatic components and their constituent parts can be identified. The reasons for deciding to repair, replace or overhaul pneumatic components can be given.

Criteria 18.19A.3.5

Replacement items selected from manufacturers catalogues to meet specifications.

Assessor guide: observe that –

Replacement parts selected from manufacturers' catalogues in compliance with specifications.

Assessor guide: confirm that –

Criteria 18.19A.3.6

Faulty items repaired/overhauled, using correct and appropriate principles, techniques and procedures.

Assessor guide: observe that –

Faulty items repaired/overhauled in accordance with work site procedures.

Assessor guide: confirm that –

The appropriate repair/overhaul procedures can be identified.

Criteria 18.19A.3.7

Component or sub assembly items refitted to equipment and tested for correct operation assessed against specifications.

Assessor guide: observe that –

The pneumatic component/sub-assembly is refitted into the system in accordance with work site procedures. The pneumatic component/sub-assembly is tested for correct operation and compliance to specifications in accordance with work site procedures.

Assessor guide: confirm that –

Element 18.19A.4 Recommission pneumatic system**Criteria 18.19A.4.1**

System or sub-assembly recommissioned according to prescribed procedures, to specifications.

Assessor guide: observe that –

The pneumatic system/sub-assembly is recommissioned to specification in accordance with standard operating procedures.

Assessor guide: confirm that –

System recommissioning procedures can be identified. The pneumatic system operational specifications can be identified.

Criteria 18.19A.4.2

Using fluid power principles and system application techniques correct operation of the system is verified.

Assessor guide: observe that –

The pneumatic system/sub-assembly is checked/tested for correct operation in accordance with work site procedures.

Assessor guide: confirm that –

Criteria 18.19A.4.3

Appropriate follow up procedures are instigated.

Assessor guide: observe that –

Where appropriate, follow up procedures are initiated in accordance with work site procedures.

Assessor guide: confirm that –

Any appropriate follow up maintenance or operational checks can be identified.

Criteria 18.19A.4.4

Maintenance records/service reports updated and completed by appropriate designated means.

Assessor guide: observe that –

All maintenance records/reports are updated and completed in accordance with work site procedures.

Assessor guide: confirm that –

The maintenance recording/reporting requirements can be identified. The consequences of inaccurate or incomplete recording/reporting of maintenance/service activities can be given.

Range statement

Work undertaken autonomously or in a team environment. This unit relates to the use of pneumatic test equipment including leak testers, escape rate gauges, hand held pressure testers and other appropriate equipment. The use of hand tools, power tools and specialist tools is included. Work tasks include the preventative maintenance, testing diagnostic fault finding, adjustment, repair, replacement and overhauling of pneumatic systems to predetermined standards of quality, safety and work practices and procedures. Pneumatic components identified, inspected and correct operational function assessed using fluid power principles to predetermined specifications, interpreted from data sheets, manufacturer's catalogues, circuit diagrams and engineering drawings. Preventative maintenance schedules undertaken on a periodic basis and appropriate documentation maintained. Tests, checks, adjustments, repair, replacement and overhaul undertaken on pneumatic assemblies/sub-assemblies, stationary/mobile equipment, pneumatic power tools to site or manufacturer's specifications. Appropriate follow up procedures instigated, adopted and appropriate documentation maintained. Where required, work is undertaken to legislative and regulatory requirements.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the maintenance and repair of pneumatic systems or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 18.20A B Maintain hydraulic system components

Band – Specialisation band A

Field – Maintenance & diagnostics

Unit Weight 4

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices

18.1A Use hand tools

18.6A Dismantle/repair/replace/assemble and fit engineering components

9.1A Draw and interpret sketch

18.2A Use power tools/hand held operations

18.55A Dismantle, replace and assemble engineering components

9.2A Interpret technical drawing

18.3A Use tools for precision work

Element 18.20A.1 Check hydraulic system components

Criteria 18.20A.1.1

System components identified correctly.

Assessor guide: observe that –

Assessor guide: confirm that –

The full range of hydraulic system components can be identified.

Criteria 18.20A.1.2

The characteristics and operational function of each system component are understood.

Assessor guide: observe that –

Assessor guide: confirm that –

The characteristics and operational function of each hydraulic system component can be identified.

Criteria 18.20A.1.3

The operational function of each component inspected and tested.

Assessor guide: observe that –

A range of hydraulic system components are inspected and tested in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for inspecting and testing hydraulic system components can be identified. The equipment required to test hydraulic system components can be identified.

Criteria 18.20A.1.4

Correct operation of each component assessed against specifications.

Assessor guide: observe that –

All relevant data sheets and specifications are obtained in accordance with standard operating procedures.

Assessor guide: confirm that –

The specifications of each hydraulic system component can be identified. Hydraulic components not operating in accordance with specifications can be identified. The reasons for hydraulic components not operating in accordance with specification can be given.

Element 18.20A.2 Identify, repair/replace faulty hydraulic system components

Criteria 18.20A.2.1

Faulty system components localised and malfunction confirmed by inspection and testing using fluid power principles, procedures and safety requirements.

Assessor guide: observe that –

All relevant hydraulic circuits, drawings, instructions, manuals and data sheets obtained in accordance with workplace procedures. The individual components within the hydraulic system are checked for correct operation in accordance with standard operating procedures.

Assessor guide: confirm that –

The individual components within the hydraulic system can be identified. The safety procedures to be followed when working on hydraulic components can be identified. Where appropriate, faulty system components can be identified.

Criteria 18.20A.2.2

Faulty system components dismantled and repaired to manufacturer's/site specifications.

Assessor guide: observe that –

Faulty system components are dismantled and repaired to manufacturer's/site specifications in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedure for repairing hydraulic system components can be identified.

Criteria 18.20A.2.3

Replacement parts selected from manufacturer's catalogues according to required specifications.

Assessor guide: observe that –

Where appropriate, replacement parts are selected from the manufacturers'/suppliers' catalogues in conformance with specifications.

Assessor guide: confirm that –

The parts to be replaced can be identified. The reasons for replacing the parts identified can be given.

Criteria 18.20A.2.4

System components reassembled and tested for correct operation and assessment against specifications.

Assessor guide: observe that –

The hydraulic system components are reassembled in accordance with standard operating procedures. The hydraulic components are tested for correct operation and conformance to specifications in accordance with standard operating procedures.

Assessor guide: confirm that –

The correct operation of the hydraulic system can be identified. The procedures for checking hydraulic system operation can be given.

Criteria 18.20A.2.5

Correct operation of the hydraulic system confirmed to designated operating procedure.

Assessor guide: observe that –

The operation of the hydraulic system is checked for conformance to specification in accordance with standard operating procedures.

Assessor guide: confirm that –

The correct operation of the hydraulic system can be identified. The procedures for checking hydraulic system operation can be given.

Criteria 18.20A.2.6

Appropriate follow up procedures adopted according to standard operating procedure.

Assessor guide: observe that –

Where appropriate, repaired/replaced hydraulic system components are checked for correct operation in accordance with standard follow up procedures.

Assessor guide: confirm that –

Where appropriate, the follow up procedures with respect to repaired/replaced hydraulic system components can be identified.

Criteria 18.20A.2.7

Where appropriate, service reports completed using standard operating procedures.

Assessor guide: observe that –

Where appropriate, service reports are completed in accordance with standard operating procedures.

Assessor guide: confirm that –

The reporting/recording procedures can be identified. The reasons for completing service reports for hydraulic system components repaired/replaced can be explained.

Range statement

Work undertaken using predetermined standards of safety, quality and work procedures. Hydraulic system components identified, inspected and assessed using fluid power principles to predetermined specifications interpreted from data sheets and circuit diagrams. Repairs and replacements to site or manufacturer's specifications. Hydraulic system components may include high pressure seals, linear, rotary actuators, directional control valves, proportional valves, timers, counters, sensors, pumps, pressure control valves, lines, hoses and other associated equipment. Correct operational function of equipment components confirmed and commissioned in conformance to specifications, using standard operating procedures. For straightforward removals/replacement of components from a Hydraulic system, see Unit 18.55A (Dismantle replace and assemble engineering components).

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the maintenance of hydraulic system components or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 18.21A A Maintain and repair hydraulic systems

Band – Specialisation band A

Field – Maintenance & diagnostics

Unit Weight 4

Notes - This unit has dual status and is to be regarded as both a Specialisation band A unit and Specialisation band B unit for progression to C5 (AQF level V)

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices

9.1A Draw and interpret sketch

9.2A Interpret technical drawing

18.1A Use hand tools

18.2A Use power tools/hand held operations

18.3A Use tools for precision work

18.6A Dismantle/repair/replace/assemble and fit engineering components

18.20A Maintain hydraulic system components

18.55A Dismantle, replace and assemble engineering components

Element 18.21A.1 Undertake preventative maintenance checks/adjustments on hydraulic systems

Criteria 18.21A.1.1

System components, assemblies or sub-assemblies are identified and prepared for inspection/preventative maintenance.

Assessor guide: observe that –

Hydraulic system components are prepared for inspection/preventative maintenance in accordance with work site procedures.

Assessor guide: confirm that –

Common hydraulic system components can be identified.

Criteria 18.21A.1.2

Visual inspection and testing with appropriate test equipment is carried out according to fluid power principles, procedures and safety requirements.

Assessor guide: observe that –

The hydraulic system and its components are inspected and tested safely in accordance with work site procedures.

Assessor guide: confirm that –

Hydraulic system/component faults that can be determined by visual inspection can be identified. The application of common hydraulic system/component test equipment can be given.

Criteria 18.21A.1.3

Scheduled preventive maintenance tasks are performed including obvious repairs and adjustments according to manufacturer's specification using fluid power techniques/practices.

Assessor guide: observe that –

Scheduled preventative maintenance tasks are performed in accordance with work site procedures. Where appropriate, obvious repairs are performed on the hydraulic system/components in accordance with work site procedures. Where appropriate, hydraulic system/components are adjusted to return the system to manufacturer's specification in accordance with work site procedures.

Assessor guide: confirm that –

Schedules preventative maintenance tasks can be identified. The manufacturer's specifications can be identified.

Element 18.21A.2 Undertake fault finding on hydraulic systems**Criteria 18.21A.2.1**

Designated hydraulic system components are identified and a visual inspection of the system is carried out for the collection of fault finding data.

Assessor guide: observe that –

The hydraulic system and its components are visually inspected for indications of correct/incorrect operation in accordance with work site procedures.

Assessor guide: confirm that –

Common hydraulic system and component faults can be identified.

Criteria 18.21A.2.2

System operator consulted where appropriate and additional data collected.

Assessor guide: observe that –

Where appropriate, the system operator is consulted with respect to the fault being investigated.

Assessor guide: confirm that –

Criteria 18.21A.2.3

Maintenance reports and preventative maintenance schedules checked and reviewed for additional fault finding data.

Assessor guide: observe that –

Maintenance reports and preventative maintenance schedules are obtained in accordance with work site procedures.

Assessor guide: confirm that –

Any previous faults in the hydraulic system/components can be identified. Any previous maintenance carried out on the hydraulic system/components can be identified.

Criteria 18.21A.2.4

Using fluid power principles, checks and tests are undertaken using appropriate test equipment and techniques.

Assessor guide: observe that –

Appropriate test equipment and techniques are used to check/test hydraulic system/component operation in accordance with work site procedures.

Assessor guide: confirm that –

Typical checks/tests that can be carried out on hydraulic systems/components and their application can be identified. Hydraulic system/component test and testing techniques can be identified.

Criteria 18.21A.2.5

Faults and malfunctions are identified and verified.

Assessor guide: observe that –

Apparent faults/malfunctions are verified/confirmed in accordance with work site procedures.

Assessor guide: confirm that –

Apparent faults/malfunctions can be identified.

Criteria 18.21A.2.6

Faults and malfunctions documented or reported by appropriate means to designated personnel and actioned.

Assessor guide: observe that –

All verified faults/malfunctions are documented or reported in accordance with work site procedures. The repair/overhaul of the hydraulic system is initiated in accordance with work site procedures.

Assessor guide: confirm that –

The documentation/reporting requirements with respect to verified faults/malfunctions can be identified. The procedures for initiating repair and/or overhaul of the hydraulic system can be identified.

Element 18.21A.3 Repair and/or overhaul hydraulic system

Criteria 18.21A.3.1

System or sub-assembly isolated safely and residue pressure discharged in accordance with prescribed procedure and checked for correct isolation.

Assessor guide: observe that –

The hydraulic system is isolated and depressurised safely in accordance with work site procedures. The hydraulic system is checked to ensure isolation and depressurisation in accordance with work site procedures.

Assessor guide: confirm that –

The hazards associated with working on hydraulic systems/components can be identified. The procedures for isolating and depressurising hydraulic systems can be identified.

Criteria 18.21A.3.2

Isolated system or sub-assembly tagged according to designated means.

Assessor guide: observe that –

The isolated hydraulic system is tagged in accordance with work site procedures.

Assessor guide: confirm that –

The tagging requirements for isolated systems can be identified.

Criteria 18.21A.3.3

Components or sub-assembly removed from system using correct removal principles and techniques.

Assessor guide: observe that –

The hydraulic components/sub-assembly are removed from the system in accordance with work site procedures.

Assessor guide: confirm that –

The structure of typical hydraulic components can be identified. The specifications of hydraulic components and their constituent parts can be identified.

Criteria 18.21A.3.4

Components or sub-assemblies dismantled, examined and verified for replacement, overhaul or repair, using correct and appropriate techniques and procedures.

Assessor guide: observe that –

The hydraulic components/sub-assemblies are dismantled in accordance with work site procedures. The hydraulic components/sub-assemblies and their parts are examined for conformance to specification. Components outside specification and not repairable are marked for replacement in accordance with work site procedures. Components outside specification and able to be returned to specification are marked for repair/overhaul in accordance with work site procedures.

Assessor guide: confirm that –

The structure of typical hydraulic components can be identified. The specifications of hydraulic components and their constituent parts can be identified.

Criteria 18.21A.3.5

Replacement items selected from manufacturer's catalogues to meet specifications.

Assessor guide: observe that –

Replacement parts selected from manufacturer's catalogues in compliance with specifications.

Assessor guide: confirm that –

Criteria 18.21A.3.6

Faulty items repaired/overhauled, using correct and appropriate principles, techniques and procedures.

Assessor guide: observe that –

Faulty items repaired/overhauled in accordance with work site procedures.

Assessor guide: confirm that –

The appropriate repair/overhaul procedures can be identified.

Criteria 18.21A.3.7

Component or sub-assembly items refitted to equipment and tested for correct operation assessed against specifications.

Assessor guide: observe that –

The hydraulic component/sub-assembly is refitted into the system in accordance with work site procedures. The hydraulic component/sub-assembly is tested for correct operation and compliance with specifications in accordance with work site procedures.

Assessor guide: confirm that –

Element 18.21A.4 Recommission hydraulic system**Criteria 18.21A.4.1**

System or sub-assembly recommissioned according to prescribed procedures to specifications.

Assessor guide: observe that –

The hydraulic system/sub-assembly is recommissioned to specification in accordance with work site procedures.

Assessor guide: confirm that –

System recommissioning procedures can be identified. The hydraulic system operational specifications can be identified.

Criteria 18.21A.4.2

Using fluid power principles and system applications techniques correct operation of the system is verified.

Assessor guide: observe that –

The hydraulic system/sub-assembly is checked/tested for correct operation in accordance with work site procedures.

Assessor guide: confirm that –

Criteria 18.21A.4.3

Appropriate follow up procedures are instigated.

Assessor guide: observe that –

Where appropriate, follow up procedures are initiated in accordance with work site procedures.

Assessor guide: confirm that –

Any appropriate follow up maintenance or operational checks can be identified.

Criteria 18.21A.4.4

Maintenance records/service reports updated and completed by appropriate designated means.

Assessor guide: observe that –

All maintenance records/reports are updated and completed in accordance with work site procedures.

Assessor guide: confirm that –

The maintenance recording/reporting requirements can be identified. The consequences of inaccurate or incomplete recording/reporting of maintenance/service activities can be given.

Range statement

Work undertaken autonomously or in a team environment. This unit relates to the use of hydraulic test equipment including leak testers, escape rate gauges, hand held pressure testers and other appropriate equipment. The use of hand tools, power tools and specialist tools included. Work tasks include the preventative maintenance, testing, diagnostic fault finding, adjustment, repair, replacement and overhauling of hydraulic systems to predetermined standards of quality, safety and work practices and procedures. Hydraulic components identified, inspected and correct operational function assessed using fluid power principles to predetermined specifications, interpreted from data sheets, manufacturer's catalogues, circuit diagrams and engineering drawings. Preventative maintenance schedules undertaken on a periodic basis and appropriate documentation maintained. Tests, checks, adjustments, repair, replacement and overhaul undertaken on hydraulic assemblies/sub-assemblies, stationary/mobile equipment, hydraulic power tools to site or manufacturers specifications. Appropriate follow up procedures instigated, adopted and appropriate documentation maintained. Where required, work is undertaken to legislative and regulatory requirements.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with maintaining and repairing hydraulic systems, or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant data sheets, catalogues, circuit diagrams and engineering drawings. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment, the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities.

Unit MEM 18.22A A Maintain/repair/replace fluid power controls

Band – Specialisation band A

Field – Maintenance & diagnostics

Unit Weight 8

Notes - This unit has dual status and is to be regarded as both a Specialisation band A unit and Specialisation band B unit for progression to C5 (AQF level V)

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices

18.1A Use hand tools

18.6A Dismantle/repair/replace/assemble and fit engineering components

18.55A Dismantle, replace and assemble engineering components

9.1A Draw and interpret sketch

18.2A Use power tools/hand held operations

18.18A Maintain pneumatic system components

9.2A Interpret technical drawing

18.3A Use tools for precision work

18.19A Maintain and repair pneumatic systems

Pre-requisite units - Path 2

2.5C11 Measure with graduated devices

18.1A Use hand tools

18.6A Dismantle/repair/replace/assemble and fit engineering components

18.55A Dismantle, replace and assemble engineering components

9.1A Draw and interpret sketch

18.2A Use power tools/hand held operations

18.20A Maintain hydraulic system components

9.2A Interpret technical drawing

18.3A Use tools for precision work

18.21A Maintain and repair hydraulic systems

Element 18.22A.1 Install/replace fluid power systems and controls

Criteria 18.22A.1.1

Fluid power control principles and system/circuit diagrams interpreted and understood.

Assessor guide: observe that –

System/circuit diagrams, system operation and control data obtained in accordance with work site procedures.

Assessor guide: confirm that –

The system operational requirements and specifications can be identified. The application of common fluid power system components and controllers can be identified.

Criteria 18.22A.1.2

System/circuit components identified and inspected for compliance with specifications.

Assessor guide: observe that –

System/circuit components are checked/inspected for compliance with specifications.

Assessor guide: confirm that –

The system/circuit components can be identified.

Criteria 18.22A.1.3

Sequential installation undertaken according to manufacturer's specifications and standard operating procedure.

Assessor guide: observe that –

The installation of the fluid power system and controls is undertaken in accordance with manufacturer's specifications and work site procedures..

Assessor guide: confirm that –

Any special installation requirements can be identified.

Element 18.22A.2 Check and adjust fluid power system control sequence and operation**Criteria 18.22A.2.1**

Controls and system operation checked against operational specifications using appropriate test equipment and application principles/techniques.

Assessor guide: observe that –

Appropriate test equipment is used to check control and system operation against specification in accordance with work site procedures.

Assessor guide: confirm that –

Fluid power test equipment and application can be identified.

Criteria 18.22A.2.2

Adjustments performed to sequence system to meet/align to operational requirements and specifications.

Assessor guide: observe that –

Where appropriate, the system is adjusted to ensure that the sequence of operations conforms to operational requirements in accordance with work site procedures.

Assessor guide: confirm that –

The correct operational sequence of the system can be identified. Typical adjustments to correct sequencing variations from specification can be given.

Criteria 18.22A.2.3

Modifications/alterations recorded and reported in accordance with standard operating procedures.

Assessor guide: observe that –

Any modifications/alterations to the system are recorded/reported in accordance with work site procedures.

Assessor guide: confirm that –

The consequences of not recording/reporting modifications to systems can be given. The procedures for recording/reporting modifications/alterations can be identified.

Criteria 18.22A.2.4

Controls and system operation checked and commissioned to specifications.

Assessor guide: observe that –

The operation of the controls and system is checked for conformance to specification. The system is commissioned in accordance with work site procedures.

Assessor guide: confirm that –

The operational and control specifications can be identified. The fluid power system commissioning procedures can be identified.

Element 18.22A.3 Fault find fluid power systems control circuit**Criteria 18.22A.3.1**

System/circuit diagrams, data sheets interpreted and understood.

Assessor guide: observe that –

All relevant system/circuit diagrams and data sheets are obtained in accordance with work site procedures.

Assessor guide: confirm that –

The system components and their specifications can be identified.

Criteria 18.22A.3.2

System/circuit components identified and inspected.

Assessor guide: observe that –

The system/circuit components are checked/inspected for conformance to specifications.

Assessor guide: confirm that –

Criteria 18.22A.3.3

System/circuit traced and action of components diagnosed to identify and localise faults.

Assessor guide: observe that –

The system/circuit components are checked for correct operation in accordance with work site procedures. Components not conforming to operational specification identified and fault localised in accordance with work site procedures.

Assessor guide: confirm that –

Criteria 18.22A.3.4

System/circuit parts tested using appropriate test equipment and application principles.

Assessor guide: observe that –

Appropriate tests are conducted on system/circuit parts in accordance with work site procedures.

Assessor guide: confirm that –

Common test equipment and its application can be identified.

Criteria 18.22A.3.5

System/circuit parts assessed against operational specifications.

Assessor guide: observe that –

System/circuit parts are checked for conformance to specifications.

Assessor guide: confirm that –

Criteria 18.22A.3.6

Fault condition localised at the component level.

Assessor guide: observe that –

Assessor guide: confirm that –

The component(s) not complying with operational specification can be identified.

Criteria 18.22A.3.7

Faulty condition evaluated, root cause analysed and corrective action planned.

Assessor guide: observe that –

An appropriate corrective action plan is documented in accordance with work site procedures.

Assessor guide: confirm that –

Typical causes of component failure can be given. The cause of the faulty condition in the component(s) can be identified. Appropriate procedures for rectifying the faulty condition can be identified.

Element 18.22A.4 Maintain, repair/replace system control components**Criteria 18.22A.4.1**

Correct maintenance procedures applied according to standard operating procedure.

Assessor guide: observe that –

Appropriate maintenance is carried out in accordance with work site procedures.

Assessor guide: confirm that –

The appropriate maintenance schedule and procedures can be identified.

Criteria 18.22A.4.2

Repair procedures selected and applied using correct and appropriate techniques, tools and equipment.

Assessor guide: observe that –

Where appropriate, control components repaired in accordance with work site procedures.

Assessor guide: confirm that –

Appropriate control component repair procedures can be identified.

Criteria 18.22A.4.3

Faulty items tested, repaired or replaced using sequential installation procedures according to manufacturer's recommendations.

Assessor guide: observe that –

Faulty items tested for conformance to specification in accordance with work site procedures. Repaired/replaced components installed in accordance with manufacturer's requirements and work site procedures.

Assessor guide: confirm that –

Any special installation requirements can be identified. Component and operational specifications can be identified. Typical test equipment and its application can be identified.

Criteria 18.22A.4.4

Replacement items selected from manufacturer's catalogues to meet specifications.

Assessor guide: observe that –

Where appropriate, replacement items are selected from manufacturer's catalogues in conformance with specifications.

Assessor guide: confirm that –

Criteria 18.22A.4.5

System control components reassembled using appropriate principles and procedures according to specifications required.

Assessor guide: observe that –

Where appropriate, control components reassembled in accordance with work site procedures.

Assessor guide: confirm that –

Element 18.22A.5 Check and adjust sequence of fluid power system controls**Criteria 18.22A.5.1**

Using circuit diagrams and fluid power system control principles identify circuit sensors and controllers.

Assessor guide: observe that –

Circuit diagrams are obtained in accordance with work site procedures.

Assessor guide: confirm that –

Circuit sensors and controllers can be identified.

Criteria 18.22A.5.2

Make necessary adjustments to sequence system control circuit to meet operational specification.

Assessor guide: observe that –

Where appropriate, the control system is adjusted to ensure conformance to operational specification in accordance with work site procedures.

Assessor guide: confirm that –

The operational requirements/specifications of the system can be identified. Common adjustments that can be made to control systems and their effect can be identified.

Criteria 18.22A.5.3

Correct operation of system control circuit checked against operational specification.

Assessor guide: observe that –

The operation of the control system is checked for conformance to operational specifications in accordance with work site procedures.

Assessor guide: confirm that –

Criteria 18.22A.5.4

Correct operation confirmed.

Assessor guide: observe that –

Assessor guide: confirm that –

The correct operation of the control system has been confirmed.

Criteria 18.22A.5.5

Fluid power system controls commissioned to specifications.

Assessor guide: observe that –

The fluid power control system is commissioned to specification in accordance with work site procedures.

Assessor guide: confirm that –

The procedures for commissioning fluid power control systems can be identified.

Criteria 18.22A.5.6

Appropriate follow up procedures adopted.

Assessor guide: observe that –

Where appropriate, maintenance and/or service follow up procedures are initiated in accordance with work site procedures.

Assessor guide: confirm that –

Any maintenance/service follow up procedures can be identified.

Criteria 18.22A.5.7

Service/maintenance report completed to standard operating procedures.

Assessor guide: observe that –

Maintenance and/or service reports are completed in accordance with work site procedures.

Assessor guide: confirm that –

The maintenance/service recording/reporting requirements can be identified.

Range statement

Work undertaken using predetermined standards of quality, safety and work procedures, autonomously or in a team environment. This unit relates to the installation/repair/replacement and maintenance of fluid power systems controls. System circuit/components identified, traced, inspected and operational function assessed and verified using fluid power principles to predetermined specifications interpreted from data sheets and circuit diagrams. Installation, adjustment, repairs, replacements and overhauls undertaken to site or manufacturer's specifications using working knowledge and application of principles of fluid power systems control sequencing which may include : PLCs, relay logic control systems, unitised/modular sensors, transducers, timers, counters and associated equipment. If skills beyond the sequencing of PLC controls are required, then Units 10.4A (Enter and change programmable controller operational parameters) and/or Unit 10.5A (Commission programmable controller programs) should also be accessed. Correct operational function of the fluid power system controls verified and commissioned in conformance to specifications.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant data sheets, catalogues, circuit diagrams and engineering drawings. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with maintaining, repairing and replacing fluid power controls, or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Special notes

During assessment, the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities.

Unit MEM 18.23B A Modify fluid power system operation

Band – Specialisation band B

Field – Maintenance & diagnostics

Unit Weight 8

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices

2.7C10 Perform computations - basic

2.8C10 Perform computations

2.14C5 Use graphical techniques and perform simple statistical computations

9.1A Draw and interpret sketch

9.2A Interpret technical drawing

18.1A Use hand tools

18.2A Use power tools/hand held operations

18.3A Use tools for precision work

18.6A Dismantle/repair/replace/assemble and fit engineering components

18.10A Equipment condition monitoring and recording

18.16B Analyse plant and equipment condition monitoring results

18.18A Maintain pneumatic system components

18.19A Maintain and repair pneumatic systems

18.20A Maintain hydraulic system components

18.21A Maintain and repair hydraulic systems

18.22A Maintain/repair/replace fluid power controls

18.55A Dismantle, replace and assemble engineering components

Element 18.23B.1 Determine modification requirements

Criteria 18.23B.1.1

Service/maintenance reports and system output information interpreted and analysed correctly.

Assessor guide: observe that –

Service/maintenance reports and system output information is obtained in accordance with work site procedures.

Assessor guide: confirm that –

Fluid power system performance, faults history and variations from operational specification can be identified.

Criteria 18.23B.1.2

Using knowledge and principles of fluid power systems, defective components, sub-assemblies and design faults are identified.

Assessor guide: observe that –

Components/sub-assemblies are checked/tested for conformance to specification in accordance with work site procedures. Design faults are confirmed in accordance with work site procedures.

Assessor guide: confirm that –

Faults attributable to poor design can be identified. Defective components/sub-assemblies can be identified.

Criteria 18.23B.1.3

Defective components and design faults verified utilising appropriate means and techniques.

Assessor guide: observe that –

Components/sub-assemblies are checked/tested for conformance to specification in accordance with work site procedures. Design faults are confirmed in accordance with work site procedures.

Assessor guide: confirm that –

Appropriate test equipment and its application can be identified. Techniques for verifying design faults can be identified.

Criteria 18.23B.1.4

Corrective action plan researched and developed in consultation with appropriate personnel.

Assessor guide: observe that –

Relevant information with respect to the modification requirements is obtained. An appropriate action plan to overcome system problems is developed in accordance with work site procedures.

Assessor guide: confirm that –

Personnel to be consulted during the modification process can be identified. Sources of information relevant to the modification requirements identified.

Criteria 18.23B.1.5

Modification/design options investigated to overcome parts failure or design faults.

Assessor guide: observe that –

Assessor guide: confirm that –

The modification/design options available to overcome system faults can be identified. The cost associated with the available options can be determined. The benefits associated with the available options can be determined.

Criteria 18.23B.1.6

Most appropriate modifications design option developed, selected and specifications prepared.

Assessor guide: observe that –

The specifications pertaining to the selected modification/design option are determined in accordance with work site procedures.

Assessor guide: confirm that –

The most appropriate modification/design option can be identified. The procedures for undertaking the selected modification/design option can be identified.

Element 18.23B.2 Undertake modifications to fluid power systems**Criteria 18.23B.2.1**

Replacement components selected from manufacturer's catalogue to meet specifications.

Assessor guide: observe that –

Assessor guide: confirm that –

Replacement components conforming to predetermined specifications can be identified from manufacturer's catalogues.

Criteria 18.23B.2.2

Modifications undertaken or delegated to appropriate personnel and supervised.

Assessor guide: observe that –

Where appropriate, modifications to fluid power systems undertaken in accordance with work site procedures. Where appropriate, work delegated to appropriate personnel and supervised in accordance with work site procedures.

Assessor guide: confirm that –

The modifications to be undertaken can be identified.

Criteria 18.23B.2.3

Modifications recorded and documented according to standard operating procedures.

Assessor guide: observe that –

The modifications to the fluid power system are recorded/reported in accordance with work site procedures.

Assessor guide: confirm that –

The requirements for recording/reporting modifications to fluid power systems can be identified.

Element 18.23B.3 Monitor and evaluate repaired or modified fluid power system**Criteria 18.23B.3.1**

Modified/repared fluid power systems monitored and operation system assessed for compliance with operational specifications.

Assessor guide: observe that –

The operation of the modified/repared fluid power system is checked for compliance with operational specifications in accordance with work site procedures.

Assessor guide: confirm that –

The revised operational specification of the fluid power system can be identified. The frequency of checks for compliance against operational specifications can be given.

Criteria 18.23B.3.2

Modifications/repairs evaluated for effectiveness, efficiency and compliance with operational specifications.

Assessor guide: observe that –

Assessor guide: confirm that –

The effectiveness and efficiency of the modifications/repairs can be identified. Any variations from operational specifications can be identified.

Criteria 18.23B.3.3

Where applicable, further corrective action recommended to appropriate personnel, instigated and monitored until desired efficiencies/outcomes are achieved.

Assessor guide: observe that –

Where applicable, further corrective action initiated and monitored in accordance with work site procedures. Where appropriate, additional action is initiated until desired outcomes are achieved in accordance with work site procedures.

Assessor guide: confirm that –

Any further modifications/repairs that could improve the effectiveness and efficiency of the fluid power system can be identified. Personnel to whom recommendations are to be made can be identified.

Criteria 18.23B.3.4

Evaluation reports completed to standard operating procedure.

Assessor guide: observe that –

Where appropriate, evaluation reports on the modifications/repairs undertaken are completed in accordance with work site procedures.

Assessor guide: confirm that –

The appropriate reporting requirements can be identified.

Range statement

Work undertaken autonomously or in a team environment. Analysis tasks performed utilising service/maintenance reports including interpretation and integration of data from process controls, instrumentation and condition monitoring systems in consultation with appropriate personnel. Using sound working knowledge and principles of fluid power systems, defective components, sub-assemblies, design faults are identified and appropriate redesign action commissioned. This action may include replacement of components, sub-assemblies using equivalent parts lists in manufacturer's catalogues. Preparation for redesign specifications, associated drawing changes/modifications, personally undertaken or delegated to appropriate personnel and supervised. All regulative, legislative requirements adhered to. Modifications covered by this unit are changes to fluid power systems and equipment that lead to desired changes in system performance. Where the modification requires the knowledge of PLC program installation or commissioning, then Unit 10.4A (Enter and change programmable controller operational parameters) and Unit 10.5A (Commission programmable controller programs) should also be selected.

Evidence guide

Assessment context

This unit should be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the modification of fluid power system operations, or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant data sheets, catalogues, circuit diagrams and engineering drawings. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment, the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities.

Unit MEM 18.24A A Maintain and repair engine cooling systems

Band – Specialisation band A

Field – Maintenance & diagnostics

Unit Weight 2

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices

9.1A Draw and interpret sketch

18.1A Use hand tools

18.2A Use power tools/hand held operations

18.55A Dismantle, replace and assemble engineering components

Element 18.24A.1 Assess cooling system operation

Criteria 18.24A.1.1

Heat transfer characteristics; water treatment; and corrosion principles and terminology understood.

Assessor guide: observe that –

Assessor guide: confirm that –

The principles of heat transfer as applied to cooling systems can be explained. The effect of water treatment and corrosion on the effectiveness of cooling system operation can be given.

Criteria 18.24A.1.2

Relevant information obtained and correctly interpreted prior to any testing.

Assessor guide: observe that –

All information relevant to the cooling system is obtained in accordance with work place procedures.

Assessor guide: confirm that –

The components of the cooling system and their function can be identified.

Criteria 18.24A.1.3

System checks undertaken safely and to prescribed procedures.

Assessor guide: observe that –

The cooling system is checked safely in accordance with standard operating procedures.

Assessor guide: confirm that –

The checks to be carried out on cooling systems can be identified. The procedures for carrying out cooling system checks can be given. The hazards associated with testing cooling systems can be identified.

Criteria 18.24A.1.4

Water/air flows, pressures and temperatures correctly determined and recorded.

Assessor guide: observe that –

The water/air flows, pressures and temperatures of the cooling system are accurately measured and recorded in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for measuring water/air flows, pressures and temperatures in cooling systems can be given. The necessary tools, techniques and equipment to carry out the above tests can be identified. The procedures for recording test results can be given.

Criteria 18.24A.1.5

Faults are correctly isolated to component level and appropriate corrective action determined.

Assessor guide: observe that –

Assessor guide: confirm that –

Any variations of test results from specifications can be identified. The likely causes of those variations can be explained. The faulty component(s) can be identified. The appropriate corrective action to be taken can be identified. The reasons for identifying the corrective action to be taken can be explained.

Criteria 18.24A.1.6

Test equipment adapted and used correctly.

Assessor guide: observe that –

Where appropriate, the test equipment is adapted for use on the cooling system being tested.

Assessor guide: confirm that –

The reasons for adapting test equipment can be given. The precautions to be taken when adapting test equipment can be identified.

Criteria 18.24A.1.7

Coolant test samples correctly obtained and tested.

Assessor guide: observe that –

Coolant test samples are obtained in accordance with standard operating procedures. The coolant samples are tested in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for taking coolant test samples can be given. The procedures for testing coolant samples can be given. The tools, techniques and equipment required to carry out tests on coolant samples can be identified. The reasons for testing coolant samples can be explained.

Criteria 18.24A.1.8

Component parts correctly assessed for re-use or replacement.

Assessor guide: observe that –

Assessor guide: confirm that –

Faulty components can be identified for repair or replacement. The reasons for identifying faulty components for repair or replacement can be given.

Element 18.24A.2 Repair/replace faulty components**Criteria 18.24A.2.1**

Component wear and clearances correctly determined using appropriate test equipment and manufacturers recommendations.

Assessor guide: observe that –

Cooling system components are checked for wear and clearances using appropriate equipment in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for testing components for wear and clearances can be given. The appropriate measuring/test equipment can be identified. The reasons for selecting the chosen measuring/test equipment can be given.

Criteria 18.24A.2.2

Replacement components correctly selected for application using manufacturers data.

Assessor guide: observe that –

All relevant specifications, parts lists, catalogues etc are obtained in accordance with work place procedures. Where appropriate, replacement parts are obtained in accordance with standard operating procedures.

Assessor guide: confirm that –

Replacement parts can be identified. The procedures for obtaining replacement parts can be given.

Criteria 18.24A.2.3

Components removed and refitted to engine following prescribed procedures.

Assessor guide: observe that –

Cooling system components are removed and refitted to the engine in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for removing/replacing cooling system components from the engine can be given.

Criteria 18.24A.2.4

Test and repair activities are accurately recorded.

Assessor guide: observe that –

Test and repair activities undertaken on the cooling system are accurately recorded in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for recording test and repair activities can be given.

Criteria 18.24A.2.5

Engine free of coolant leaks and cooling system contains the correct level of additive/inhibitor after repair work is carried out.

Assessor guide: observe that –

The engine is tested for coolant leaks after repair in accordance with standard operating procedures. The coolant level is checked after repair in accordance with standard operating procedures. The coolant contains the correct amount of additive/inhibitor after the repair.

Assessor guide: confirm that –

The procedures for checking coolant levels and engine coolant leaks can be given. The correct amount of additive/ inhibitor to be added to the coolant can be identified.

Range statement

Cooling system testing would typically require the person to obtain air and/or water flows, temperatures and pressures; assessing serviceability and repair of a range of flow/pressure regulators; sensors, actuators and solenoids on shutter type systems or fan drives; or water type inter/after and oil coolers. Typical symptoms of faults would be coolant pressures/the presence of steam, gases, oil, fuel or air. This unit would typically apply to engine or vehicle cooling systems. On large stationary plant, cooling systems may include the use of cooling towers. All work undertaken to manufacturers specifications and standard operating procedures.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the maintenance and repair of engine cooling systems or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 18.25A A Service combustion engines

Band – Specialisation band A

Field – Maintenance & diagnostics

Unit Weight 2

Pre-requisite units - Path 1

18.1A Use hand tools

Element 18.25A.1 Check and assess items for serviceability

Criteria 18.25A.1.1

Serviceable replacement items correctly assessed regarding serviceability.

Assessor guide: observe that –

Items removed from the engine are checked for serviceability. Items removed from the engine are checked for conformance to specifications.

Assessor guide: confirm that –

Items removed from the engine that are serviceable can be identified. Items removed from the engine that are unserviceable and are to be replaced can be identified. The specifications of the items removed can be identified.

Criteria 18.25A.1.2

Replacement fluids/items correctly determined for application using manufacturers data.

Assessor guide: observe that –

All relevant manufacturer's data is obtained in accordance with work place procedures.

Assessor guide: confirm that –

The replacement fluids and items can be correctly identified from manufacturer's data.

Criteria 18.25A.1.3

Abnormal appearance/condition of serviceable items/fluids identified and reported to appropriate authority.

Assessor guide: observe that –

Where appropriate, fluids and items having abnormal appearance are reported to the appropriate authority.

Assessor guide: confirm that –

Common defects that can be identified from the items' appearance can be given. The procedures for reporting items/fluids with abnormal appearance can be given. The person to whom the abnormal appearance of the items is to be reported can be identified.

Criteria 18.25A.1.4

Lubricant, cooling system additives and filtering principles understood.

Assessor guide: observe that –

Assessor guide: confirm that –

The principles of operation of the lubrication system can be given. The principles of operation of the cooling system can be given. The function of filters can be given. The purpose of a range of additives can be given.

Element 18.25A.2 Perform servicing procedures

Criteria 18.25A.2.1

Engine fluids flushed, cleaned and replaced with correct fluid and/or additives, and to the correct level/concentration according to manufacturers recommendations.

Assessor guide: observe that –

The engine fluids are flushed from the engine in accordance with standard operating procedures. The engine is cleaned of any residual fluids. The engine fluids are replaced with the correct fluids in accordance with standard operating procedures. Where appropriate, fluid additives are added in the correct proportion in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for flushing fluids from the engine can be given. The reasons for ensuring any residual/spilt fluids are removed from the engine can be given. The appropriate grade and type of replacement fluid can be identified. The procedures for replacing engine fluids can be given. The correct proportions of additive to be used can be identified.

Criteria 18.25A.2.2

Serviceable items removed and replaced according to manufacturers recommended procedures.

Assessor guide: observe that –

Serviceable items are removed and replaced in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for removing/ replacing serviceable items can be given.

Criteria 18.25A.2.3

Engine free of lubricant, water and air leaks after servicing work.

Assessor guide: observe that –

The engine is checked for lubricant, water and air leaks after servicing in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for checking serviced engines for leaks can be identified.

Criteria 18.25A.2.4

Hoses, wiring, ducts etc. correctly secured after servicing work.

Assessor guide: observe that –

All wires, hoses, ducts are correctly secured after servicing.

Assessor guide: confirm that –

The methods of fastening/securing wires, hoses, ducts, etc can be identified.

Criteria 18.25A.2.5

Minor running adjustments made to specification.

Assessor guide: observe that –

Minor running adjustments are made to specification in accordance with standard operating procedures.

Assessor guide: confirm that –

The minor running adjustments to be made can be identified. The procedures for undertaking minor running adjustments can be given. The specifications pertaining to those adjustments can be given.

Criteria 18.25A.2.6

Test samples correctly obtained from system as determined by standard operating procedures.

Assessor guide: observe that –

Test samples are correctly obtained in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for taking test samples can be given. The samples to be taken can be identified.

Element 18.25A.3 Report activities**Criteria 18.25A.3.1**

Servicing activities accurately recorded on report sheet/proforma; or accurate oral report given.

Assessor guide: observe that –

Servicing activities undertaken are reported in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for reporting service activities undertaken can be given.

Range statement

This unit applies to the assessment and replacement of serviceable items such as filters/conditioners, coolants, lubricants and hydraulic fluids, additives, etc; and the carrying out of servicing activities to predetermined procedures or manufacturers specifications, including minor running adjustments. Servicing activities may include obtaining and despatching samples for spectrographic or laboratory analysis. Adjustments are limited to "running adjustments" typical of which are vee belt tensions, shroud clearances, linkage adjustments, etc. This unit should not be selected if Unit 18.55A (Dismantle, replace and assemble engineering components) has already been selected.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the servicing of combustion engines or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 18.26A B Test compression ignition fuel systems

Band – Specialisation band A

Field – Maintenance & diagnostics

Unit Weight 4

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices

9.1A Draw and interpret sketch

18.1A Use hand tools

Element 18.26A.1 Assess fuel system operation

Criteria 18.26A.1.1

Fuel injection principles and component part functions/operation understood.

Assessor guide: observe that –

Assessor guide: confirm that –

The principles of fuel injection can be explained. The function/operation of each component in a fuel injection system can be identified.

Criteria 18.26A.1.2

Plant/equipment started, operated and shutdown to prescribed procedures.

Assessor guide: observe that –

Diesel plant/equipment is started/ operated and shut down in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for starting up, operating and shutting down diesel plant and equipment can be given.

Criteria 18.26A.1.3

Checks undertaken safely and to prescribed procedures.

Assessor guide: observe that –

Operational checks of the diesel fuel system are safely undertaken in accordance with standard operating procedures.

Assessor guide: confirm that –

The operational checks to be made on the diesel fuel system can be identified. The procedures for carrying out operational checks on diesel fuel systems can be given.

Criteria 18.26A.1.4

Flows, pressures, speeds correctly determined and recorded.

Assessor guide: observe that –

Fuel flows, pressures and engine speed are correctly determined and recorded in accordance with standard operating procedures.

Assessor guide: confirm that –

The methods of determining flows, pressures and speeds can be identified. The tools, techniques and equipment to be used to measure flows, pressures and speeds can be identified. The procedures for carrying out the above tests can be given. The procedures for recording test results can be given.

Criteria 18.26A.1.5 Plant operating characteristics and parameters understood.	<i>Assessor guide: observe that –</i>	<i>Assessor guide: confirm that –</i> The plant operating characteristics can be identified. The plant operating parameters can be identified.
Criteria 18.26A.1.6 Data is correctly interpreted regarding serviceability.	<i>Assessor guide: observe that –</i>	<i>Assessor guide: confirm that –</i> The serviceability of the fuel system can be determined from the test results and plant operating characteristics and parameters. The reasons for the decisions made with respect to serviceability can be explained.
Criteria 18.26A.1.7 Faults are correctly interpreted regarding serviceability.	<i>Assessor guide: observe that –</i>	<i>Assessor guide: confirm that –</i> For unserviceable systems the likely faults can be identified. The reasons for identifying the likely faults can be given.
Criteria 18.26A.1.8 Governing characteristics and terminology understood.	<i>Assessor guide: observe that –</i>	<i>Assessor guide: confirm that –</i> The principles of governing can be explained. The function of the governor on the given plant/equipment can be identified.
Criteria 18.26A.1.9 Test equipment used correctly.	<i>Assessor guide: observe that –</i> All test equipment is used correctly in accordance with standard operating procedures.	<i>Assessor guide: confirm that –</i>

Range statement

Operation of plant and equipment would be performed within the persons licensing limits or as determined by relevant regulations. Fuel system components include diesel injectors, fuel pumps, governing apparatus and replacement would require the person to time the high pressure fuel pump or injectors to engine. Final adjustment may include the setting of low/high or no load/full load speed and/or droop, sensitivity, stability, promptness etc.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the maintenance of diesel fuel systems or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 18.27A B Overhaul engine fuel system components

Band – Specialisation band A

Field – Maintenance & diagnostics

Unit Weight 8

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices
18.2A Use power tools/hand held operations

9.1A Draw and interpret sketch
18.55A Dismantle, replace and assemble engineering components

18.1A Use hand tools

Pre-requisite units - Path 2

2.5C11 Measure with graduated devices
18.2A Use power tools/hand held operations

9.2A Interpret technical drawing
18.55A Dismantle, replace and assemble engineering components

18.1A Use hand tools

Element 18.27A.1 Clean and assess parts

Criteria 18.27A.1.1

Components disassembled according to manufacturers recommendation's.

Assessor guide: observe that –
Manufacturer's procedures are obtained in accordance with work place procedures. The engine fuel system components are disassembled in accordance with manufacturer's procedures.

Assessor guide: confirm that –
The sequence for disassembling engine fuel components can be identified.

Criteria 18.27A.1.2

Specialised tools used correctly.

Assessor guide: observe that –
Where appropriate, specialised tools are correctly used.

Assessor guide: confirm that –
Any specialised tools required and their application can be identified.

Criteria 18.27A.1.3

Parts are assessed visually for abnormal wear or defects.

Assessor guide: observe that –
Parts are visually checked for abnormal wear or defects.

Assessor guide: confirm that –
Common defects and examples of abnormal wear can be identified from given samples.

Criteria 18.27A.1.4

Characteristics of surface finishes and wear patterns associated with pumps/governors/injectors understood.

Assessor guide: observe that –

Assessor guide: confirm that –
The characteristics of surface finishes and wear patterns for fuel system components can be identified. Examples of wear patterns and their cause can be given.

Criteria 18.27A.1.5

Appropriate cleaning method/solution and procedure selected.

Assessor guide: observe that –

Assessor guide: confirm that –

The method of cleaning fuel system components can be identified. The appropriate solvents for cleaning fuel systems can be identified. The procedures for cleaning fuel systems can be given.

Criteria 18.27A.1.6

Parts correctly protected and stored ready for reassembly.

Assessor guide: observe that –

Fuel system parts are appropriately protected and stored in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for protecting and storing fuel system components can be given.

Criteria 18.27A.1.7

Parts made identifiable according to their original location in the pump/injector and protected and stored as required for reassembly.

Assessor guide: observe that –

Parts are identified according to their original location in the pump/injector in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for marking fuel system components in readiness for reassembly can be given.

Element 18.27A.2 Record and interpret measurements**Criteria 18.27A.2.1**

Measurements are accurately obtained and recorded.

Assessor guide: observe that –

Fuel system components are accurately measured. Measurements taken are recorded accurately in accordance with standard operating procedures.

Assessor guide: confirm that –

The measuring instruments to be used to measure fuel system components can be identified. The reason for selecting the chosen measuring instruments can be given. The procedures for recording fuel system component measurements can be given.

Criteria 18.27A.2.2

Measurements and part condition correctly interpreted when determining reuse/replacement.

Assessor guide: observe that –

The specifications, parts lists, etc. of fuel system components are obtained in accordance with work place procedures.

Assessor guide: confirm that –

The measurements taken and the component specifications are compared and out of specification parts identified. Parts to be reused/replaced can be identified. The reasons for the decisions made with respect to reuse/replacement can be explained.

Element 18.27A.3 Recondition and set up equipment**Criteria 18.27A.3.1**

Fuel system and governing functions, characteristics, applications and terminology understood.

Assessor guide: observe that –

Assessor guide: confirm that –

The principles of operation of diesel fuel systems can be explained.

Criteria 18.27A.3.2

Components identified as faulty are reconditioned and replaced.

Assessor guide: observe that –

Faulty components are replaced or reconditioned in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for reconditioning faulty fuel system components can be given. The procedures for replacing faulty fuel system components can be given.

Criteria 18.27A.3.3

Components assembled according to manufacturer's specifications.

Assessor guide: observe that –

Fuel system components are assembled in accordance with manufacturer's specifications and procedures.

Assessor guide: confirm that –

The procedures for assembling fuel system components can be given. The specifications of the fuel system components can be identified.

Criteria 18.27A.3.4

Test equipment used correctly.

Assessor guide: observe that –

All test equipment is used correctly in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for testing fuel system components can be given. The tools, techniques and equipment required to carry out fuel system component tests can be identified.

Criteria 18.27A.3.5

Components tested and set to specifications.

Assessor guide: observe that –

Fuel system components are tested and set to specifications in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for setting fuel system components can be given.

Range statement

This unit refers to work typically undertaken on large stationary or mobile diesel engines and would entail the rebuilding/setting up of diesel fuel pumps, governors, injectors and associated equipment. Governor types include mechanical, pneumatic, hydraulic and electronic. Fuel system types typically include port and helix, sleeve metering, unit injection, distributor and pressure/time. All work undertaken to manufacturer's specifications and standard operating procedures.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the overhaul of engine fuel system components or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 18.28A B Maintain and repair engine lubrication systems

Band – Specialisation band A

Field – Maintenance & diagnostics

Unit Weight 2

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices
18.2A Use power tools/hand held operations

9.1A Draw and interpret sketch
18.55A Dismantle, replace and assemble engineering components

18.1A Use hand tools

Pre-requisite units - Path 2

2.5C11 Measure with graduated devices
18.2A Use power tools/hand held operations

9.2A Interpret technical drawing
18.55A Dismantle, replace and assemble engineering components

18.1A Use hand tools

Element 18.28A.1 Assess lubrication system operation

Criteria 18.28A.1.1

Relevant information is obtained and correctly interpreted prior to any testing.

Assessor guide: observe that –
All relevant instructions, specifications, procedures, etc. are obtained in accordance with work place procedures.

Assessor guide: confirm that –
The operation of the lubrication system can be identified.

Criteria 18.28A.1.2

Checks undertaken safely and to prescribed procedures.

Assessor guide: observe that –
The lubrication system is checked safely in accordance with standard operating procedures.

Assessor guide: confirm that –
The procedures for testing/checking lubrication systems can be given. The precautions to be taken when checking lubrication systems can be identified.

Criteria 18.28A.1.3

Flows, pressures, temperatures correctly determined and recorded.

Assessor guide: observe that –
Oil flows, pressures and temperatures are correctly determined and recorded in accordance with standard operating procedures.

Assessor guide: confirm that –
The tests to be undertaken can be identified. The equipment and techniques to be used to determine oil flows, pressures and temperatures can be identified. The procedures for recording lubrication system test results can be given.

<p>Criteria 18.28A.1.4 Faults are correctly isolated to component level and appropriate corrective action determined.</p>	<p><i>Assessor guide: observe that –</i></p>	<p><i>Assessor guide: confirm that –</i> The specifications of the lubrication system components can be identified. Faulty components can be identified. The appropriate corrective action can be identified. The reasons for proposing the identified corrective action can be given.</p>
<p>Criteria 18.28A.1.5 Lubricant fluid characteristics, terminology and applications understood.</p>	<p><i>Assessor guide: observe that –</i></p>	<p><i>Assessor guide: confirm that –</i> The characteristics of lubricants can be explained. The application of a variety of lubricants can be identified.</p>
<p>Criteria 18.28A.1.6 Test equipment used correctly.</p>	<p><i>Assessor guide: observe that –</i> All test equipment is used correctly in accordance with standard operating procedures.</p>	<p><i>Assessor guide: confirm that –</i></p>
<p>Criteria 18.28A.1.7 Results of spectrographic or laboratory analysis correctly evaluated and recommendations made regarding adjustments to future maintenance activities.</p>	<p><i>Assessor guide: observe that –</i> Where appropriate, the results of lubricating oil tests are obtained in accordance with standard operating procedures.</p>	<p><i>Assessor guide: confirm that –</i> The procedures for analysing lubricating oil samples can be given. The reasons for undertaking lubricating oil analysis can be explained. The likely causes of a range of out of specification test results can be given. The appropriate corrective action to be taken can be given. The implications of out of specification test results on maintenance schedules and requirements can be explained.</p>
<p>Criteria 18.28A.1.8 Auxiliary lubrication systems assessed for correct operation.</p>	<p><i>Assessor guide: observe that –</i> Where appropriate, auxiliary lubrication systems are checked for correct operation.</p>	<p><i>Assessor guide: confirm that –</i> The reasons for installing auxiliary lubrication systems on diesel plant and equipment can be given. The operation of the auxiliary lubrication system can be identified.</p>

Element 18.28A.2 Repair/replace faulty components**Criteria 18.28A.2.1**

Replacement components correctly selected using manufacturer's data.

Assessor guide: observe that –

Replacement components are correctly selected.

Assessor guide: confirm that –

Criteria 18.28A.2.2

Components removed and refitted to engine following prescribed procedures.

Assessor guide: observe that –

Lubrication system components are removed and refitted to the engine in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for removing/replacing lubrication system components can be given.

Criteria 18.28A.2.3

Final adjustments made that bring system in line with specifications.

Assessor guide: observe that –

The lubrication system is adjusted in conformance to specifications and standard operating procedures.

Assessor guide: confirm that –

The adjustments that can be made to the lubrication system can be identified. The procedures for adjusting lubrication systems can be given.

Criteria 18.28A.2.4

Test and repair activities accurately recorded.

Assessor guide: observe that –

All test and repair activities are accurately recorded in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for recording test and repair activities can be given.

Criteria 18.28A.2.5

Engine free of lubricant leaks after repair work is carried out.

Assessor guide: observe that –

The engine is free of lubricant leaks after the repair work is carried out.

Assessor guide: confirm that –

The procedures for checking lubrication systems for leaks can be given.

Criteria 18.28A.2.6

Component wear and clearances correctly determined using appropriate test equipment and manufacturer's recommendations.

Assessor guide: observe that –

Lubrication system components are checked for wear and clearance in accordance with standard operating procedures.

Assessor guide: confirm that –

The measuring equipment and techniques to be used to determine lubrication system component wear and clearances can be identified. The procedures for determining wear and clearances can be given.

Range statement

Lubrication system testing would require obtaining flow, temperature and pressure measurements. Adjustments may include setting of bypass/regulating/relief valves to specified pressures of flows and typical symptoms of faults would be lubrication pressures/temperatures that are too low/high; excessive or too little consumption/flow, etc.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the maintenance and repair of engine lubrication systems or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 18.29A A Tune diesel engine

Band – Specialisation band A

Field – Maintenance & diagnostics

Unit Weight 4

Pre-requisite units - Path 2

2.5C11 Measure with graduated devices
18.2A Use power tools/hand held operations

9.1A Draw and interpret sketch
18.26A Test compression ignition fuel systems

18.1A Use hand tools
18.55A Dismantle, replace and assemble engineering components

Pre-requisite units - Path 2

2.5C11 Measure with graduated devices
18.2A Use power tools/hand held operations

9.2A Interpret technical drawing
18.26A Test compression ignition fuel systems

18.1A Use hand tools
18.55A Dismantle, replace and assemble engineering components

Element 18.29A.1 Compression test engine

Criteria 18.29A.1.1

Injectors removed and fuel system for each cylinder isolated correctly.

Assessor guide: observe that –

The injectors are removed from each cylinder and the fuel system isolated in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for removing injectors from cylinders can be given. The reasons for isolating the fuel system can be given.

Criteria 18.29A.1.2

Appropriate adaptors selected and fitted.

Assessor guide: observe that –

Appropriate adaptors are fitted to the cylinders in accordance with standard operating procedures.

Assessor guide: confirm that –

Appropriate adaptors can be identified. The reasons for using adaptors can be given. The procedures for fitting adaptors to the cylinders can be given.

Criteria 18.29A.1.3

Readings obtained are accurately recorded and interpreted.

Assessor guide: observe that –

Compression readings are obtained and recorded accurately in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for compression testing diesel engines can be given. The procedures for recording compression readings can be given. The compression readings are compared with specifications and any deviations identified. The likely causes of any detected deviations from specification can be given.

Criteria 18.29A.1.4

Compression readings corrected for adaptor used.

Assessor guide: observe that –

The compression readings taken are corrected for the adaptor used.

Assessor guide: confirm that –

The corrections required to be made to compression readings to take account of the adaptor used can be identified. The reasons why corrections have to be made to the compression readings taken can be explained.

Element 18.29A.2 Perform tune up**Criteria 18.29A.2.0**

If applicable, firing pressures accurately determined and adjusted to specification.

Assessor guide: observe that –

Where appropriate, firing pressures are adjusted to specification in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for adjusting firing pressures can be given. The firing pressures to be achieved can be identified.

Criteria 18.29A.2.1

Engine started, operated, loaded, and shut down safely.

Assessor guide: observe that –

The engine is started, operated, loaded and shut down safely in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for starting, operating, loading and shutting down diesel engines can be given. The hazards associated with starting, operating, loading and shutting down diesel engines can be given.

Criteria 18.29A.2.2

Test equipment correctly applied.

Assessor guide: observe that –

All test equipment is correctly applied in accordance with standard operating procedures.

Assessor guide: confirm that –

The test equipment to be used in the tuning of diesel engines can be identified. The procedures for carrying out tests on diesel engines can be given.

Criteria 18.29A.2.3

Air restriction, boost, back pressure, flow tests performed according to manufacturer's recommendations.

Assessor guide: observe that –

The appropriate tests are carried out in accordance with standard operating procedures.

Assessor guide: confirm that –

The manufacturer's recommended tests can be identified. The reasons for conducting the tests can be given.

<p>Criteria 18.29A.2.4 Readings recorded and variances from specifications correctly determined.</p>	<p><i>Assessor guide: observe that –</i> All test readings are recorded in accordance with standard operating procedures.</p>	<p><i>Assessor guide: confirm that –</i> The procedures for recording test results can be given. Variations from specifications of any test result can be identified.</p>
<p>Criteria 18.29A.2.5 Density of exhaust smoke correctly determined.</p>	<p><i>Assessor guide: observe that –</i> The density of exhaust smoke is correctly determined in accordance with standard operating procedures.</p>	<p><i>Assessor guide: confirm that –</i> The procedures for determining exhaust smoke density can be given. The equipment and techniques required to measure exhaust smoke density can be identified. The reasons for determining exhaust smoke density can be given.</p>
<p>Criteria 18.29A.2.6 Valve clearance and/or timing correctly adjusted.</p>	<p><i>Assessor guide: observe that –</i> Valve clearance and/or timing is correctly adjusted in accordance with standard operating procedures.</p>	<p><i>Assessor guide: confirm that –</i> The procedures for adjusting valve clearances and/or timing can be given. The clearances and timing to be achieved can be identified.</p>
<p>Criteria 18.29A.2.7 Injection pump or injector timing adjusted to specification.</p>	<p><i>Assessor guide: observe that –</i> Injector pump or injector timing is adjusted to specification in accordance with standard operating procedures.</p>	<p><i>Assessor guide: confirm that –</i> The procedures for adjusting injector pump and injector timing can be given. The timing and pressures to be achieved can be identified.</p>
<p>Criteria 18.29A.2.8 Governor rack travel, torque spring load limit, overspeed trips, aneroid or fuel ratio control adjusted to specification.</p>	<p><i>Assessor guide: observe that –</i> The governor rack travel, torque spring load limit, overspeed trips, aneroid or fuel ratio control is adjusted to specification in accordance with standard operating procedures.</p>	<p><i>Assessor guide: confirm that –</i> The procedures for adjusting the governor rack travel, torque spring load limit, overspeed trips, aneroid or fuel ratio control can be given. The governor specifications can be identified.</p>
<p>Criteria 18.29A.2.9 Injector opening pressure correctly determined and adjusted.</p>	<p><i>Assessor guide: observe that –</i> The injector opening pressure is adjusted to specification in accordance with standard operating procedures.</p>	<p><i>Assessor guide: confirm that –</i> The procedures for adjusting injector opening pressure can be given. The injector opening pressure to be achieved can be identified.</p>

Range statement

This unit covers tune up procedures and the evaluation of engine performance on compression ignition engines. The person performing these tasks should be able to demonstrate an understanding of the theories and be able to carry out manufacturers procedures associated with servicing, adjusting and evaluating engine performance and be able to perform the following: remove injectors, install a compression gauge, carry out a compression test and interpret the test results; carry out a machine stall test or engine load test to determine engine condition by measuring air inlet restriction, boost pressure, exhaust back pressure and crankcase pressure; evaluate exhaust smoke and determine corrective action if required; adjust engine valve clearances; check and adjust injection pump timing on in-line pumps and rotary pumps using either spill, pin, mark or dial gauge methods; time and calibrate unit injectors; adjust governor settings - maximum speed/idle speed; test and adjust injectors; be able to isolate injectors on a running engine to determine cylinder misfire.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the tuning of diesel engines or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 18.30A A Diagnose and repair low voltage electrical systems

Band – Specialisation band A

Field – Maintenance & diagnostics

Unit Weight 8

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices
18.2A Use power tools/hand held operations

9.1A Draw and interpret sketch
18.55A Dismantle, replace and assemble engineering components

18.1A Use hand tools

Pre-requisite units - Path 2

2.5C11 Measure with graduated devices
18.2A Use power tools/hand held operations

9.2A Interpret technical drawing
18.55A Dismantle, replace and assemble engineering components

18.1A Use hand tools

Element 18.30A.1 Use test instruments

Criteria 18.30A.1.1

Electron theory, current, voltage and resistance principles understood.

Assessor guide: observe that –

Assessor guide: confirm that –

The principles of electron theory can be explained. The terms current, voltage and resistance can be defined in terms of electrical circuits. The relationships between current, voltage and resistance for a variety of given electrical circuits can be identified.

Criteria 18.30A.1.2

Select, correctly use and maintain test instruments appropriate for determining current, voltage and resistance.

Assessor guide: observe that –

For a variety of electrical circuits the correct test instrument is selected and appropriately used to measure the current, voltage and resistance of specified circuit components or sections of circuitry. Test equipment is maintained in accordance with standard operating procedures.

Assessor guide: confirm that –

The instruments to be used to measure current, voltage and resistance can be identified. The procedures for measuring current, voltage and resistance can be given. The units of current, voltage and resistance can be identified. The procedures for maintaining electrical test equipment can be identified.

Criteria 18.30A.1.3

Electrical drawings and manufacturers diagrams correctly interpreted.

Assessor guide: observe that –

Assessor guide: confirm that –

The function of a variety of electrical circuits can be identified from given electrical drawings/diagrams. The symbols used in electrical drawings/diagrams can be correctly identified. The components of a variety of electrical circuits can be identified from given electrical drawings/diagrams.

Criteria 18.30A.1.4

Series, parallel and series parallel circuits correctly determined.

Assessor guide: observe that –

Assessor guide: confirm that –

The differences between series and parallel electrical circuits can be explained. A variety of electrical circuits can be correctly identified as being series, parallel, or combined series and parallel.

Criteria 18.30A.1.5

Basic electrical laws understood and correctly applied.

Assessor guide: observe that –

Assessor guide: confirm that –

Ohms law can be identified and applied to determine the required values of voltage, current and resistance for a range of electrical circuits. The laws for determining the resistance of series and parallel circuits can be identified and applied to determine the resistance of a range of electrical circuits.

Criteria 18.30A.1.6

AVR test instruments correctly connected into circuits.

Assessor guide: observe that –

Electrical test instruments are correctly connected into given circuits to determine the required values of current, voltage and resistance.

Assessor guide: confirm that –

Criteria 18.30A.1.7

Meters read to standard accuracy; and wave form and quantities determined using general purpose oscilloscope.

Assessor guide: observe that –

A general purpose oscilloscope can be correctly connected to a given electrical circuit and adjusted in accordance with standard operating procedures to measure wave forms at nominated points in the circuit.

Assessor guide: confirm that –

The function of a general purpose oscilloscope can be explained. The procedures for connecting a general purpose oscilloscope into given electrical circuits can be identified. The use of wave forms in the diagnosis of electrical circuits can be explained. The accuracy to which a range of electrical test equipment can be read can be identified.

Criteria 18.30A.1.8

Multipliers and shunts correctly used and applied.

Assessor guide: observe that –

Assessor guide: confirm that –

The use of multipliers and shunts in the measurement of electrical circuits can be identified. The procedures for using multipliers and shunts can be given.

Element 18.30A.2 Test battery**Criteria 18.30A.2.1**

Chemical battery operating principles understood.

Assessor guide: observe that –

Assessor guide: confirm that –

The operation of a chemical battery can be explained.

Criteria 18.30A.2.2

Electrolyte level is correctly determined and specific gravity readings temperature corrected.

Assessor guide: observe that –

For given batteries, the specific gravity of the electrolyte is correctly determined and corrected where appropriate for temperature variations in accordance with standard operating procedures. The electrolyte level for a number of given batteries is correctly determined in accordance with standard operating procedures.

Assessor guide: confirm that –

The function of the electrolyte in batteries can be identified. The procedures for measuring the specific gravity of the electrolyte can be given. The effect of temperature on the specific gravity of the electrolyte can be explained.

Criteria 18.30A.2.3

Dry charge preparation and recharging of batteries is carried out correctly.

Assessor guide: observe that –

Where appropriate, dry batteries are safely prepared for charging in accordance with standard operating procedures. Batteries are safely recharged in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for preparing dry batteries for charging can be given. The procedures for recharging batteries can be identified. The hazards associated with charging/recharging of batteries can be identified.

Criteria 18.30A.2.4

Discharge testing performed according to prescribed procedures.

Assessor guide: observe that –

Where appropriate, batteries are safely discharge tested in accordance with standard operating procedures.

Assessor guide: confirm that –

The purpose of discharge testing of batteries can be explained. The procedures for discharge testing batteries can be identified. The hazards associated with the discharge testing of batteries can be identified.

Criteria 18.30A.2.5

Replacement batteries correctly selected for application.

Assessor guide: observe that –

Assessor guide: confirm that –

The specifications applied to batteries can be correctly identified. For given battery specifications, replacement batteries can be identified from supplier catalogues.

Element 18.30A.3 Assess and repair wiring faults**Criteria 18.30A.3.1**

Wiring faults correctly isolated.

Assessor guide: observe that –

The correct tests are carried out on given electrical circuits and where appropriate, wiring faults are correctly identified.

Assessor guide: confirm that –

Examples of common faults in electrical wiring can be given. The causes of the common faults in electrical wiring can be explained. The test procedures for isolating wiring faults can be identified.

Criteria 18.30A.3.2

Replacement cables/wires correctly sized.

Assessor guide: observe that –

All relevant drawings, circuits, specifications and instructions are obtained in accordance with work place procedures.

Assessor guide: confirm that –

The specifications of cables and wires used in given electrical circuits can be identified. For given cable/wire specifications, replacement cables/wires can be identified from supplier catalogues.

Criteria 18.30A.3.3

Insulation quality correctly determined.

Assessor guide: observe that –

Assessor guide: confirm that –

The specification of the insulation materials can be identified. For given insulation specifications, replacement insulation materials can be identified from supplier catalogues.

Criteria 18.30A.3.4

Wiring looms correctly made up for application and securely fixed.

Assessor guide: observe that –

Where appropriate, wiring looms are made up in accordance with specifications and securely fixed in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for making up wiring looms can be given. The procedures for fixing wiring looms can be given. The appropriate fixing points and methods for wiring looms can be identified.

Criteria 18.30A.3.5

Wiring terminations stripped, fitted, prepared and made correctly.

Assessor guide: observe that –

Where appropriate, wiring is correctly terminated in accordance with specifications and standard operating procedures.

Assessor guide: confirm that –

The procedures for stripping, fitting and preparing wiring terminations can be given. The procedures for soft and hard soldering/crimping of wiring terminations can be identified. The specifications of the wiring terminations to be carried out can be identified.

Criteria 18.30A.3.6

Corrosion removed, neutralised and appropriate protective coating applied.

Assessor guide: observe that –

Where appropriate, corrosion is removed and/or neutralised from terminals and connections, and appropriate protective coatings applied in accordance with standard operating procedures.

Assessor guide: confirm that –

The effect of corrosion on the performance of electrical circuits and connections can be explained. The procedures for corrosion removal and/or neutralisation can be given. A range of coatings to stop/inhibit corrosion can be identified.

Criteria 18.30A.3.7

Relays, solenoids, contacts and circuits are correctly tested and repaired/replaced.

Assessor guide: observe that –

A range of circuit components are tested for correct operation in accordance with standard operating procedures. Where appropriate, faulty circuit components are repaired in accordance with standard operating procedures. Where appropriate, the faulty circuit components are replaced in accordance with standard operating procedures.

Assessor guide: confirm that –

The correct operational relays, solenoids and contacts can be explained. Common faults in relays, solenoids, contacts and circuits can be identified. The causes of faults in relays, solenoids, contacts and circuits can be given. The procedures for testing circuit components can be identified. The specifications of circuit components can be identified. For given circuit components, appropriate replacements can be selected from suppliers' catalogues.

Range statement

This unit applies to testing and repair activities associated with 12, 24 and 36 volt wiring systems on vehicles, plant and stationary equipment. The system extends to wiring, switching mechanisms and circuit protection devices. This unit should not be selected with any of the following Units: Unit 18.45A (Fault find/repair AC and DC electrical equipment/components which use up to 240 volts single phase supply (non-interconnected)), or Unit 18.46A (Fault find/repair AC and DC electrical equipment/components, which use up to 1000 volts AC or 1500 volts DC single phase supply (non-interconnected)). Except in exceptional circumstances this unit should not be selected with Unit 18.56A (Diagnose and repair analog equipment and components) or Unit 18.66A (Diagnose and repair microprocessor based equipment). If soldering of wires/connections is required see Unit 5.1A (Manual soldering/desoldering - electrical/electronic components).

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the diagnosis and repair of low voltage electrical systems or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 18.31A A Diagnose and repair low voltage starting systems

Band – Specialisation band A

Field – Maintenance & diagnostics

Unit Weight 2

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices

9.1A Draw and interpret sketch

18.1A Use hand tools

18.2A Use power tools/hand held operations

18.30A Diagnose and repair low voltage electrical systems

18.55A Dismantle, replace and assemble engineering components

Element 18.31A.1 Assess starting motor operation

Criteria 18.31A.1.1

Magnetism, induced voltage and electromagnetism, electric motor principles understood.

Assessor guide: observe that –

Assessor guide: confirm that –

The concepts of magnetism, electromagnetism and induced voltage can be explained. The construction of electric motors can be identified. The principles of operation of electric motors can be explained.

Criteria 18.31A.1.2

Starting motor component functions and multi-pole/winding/shunt wiring arrangements are understood.

Assessor guide: observe that –

Assessor guide: confirm that –

The components of common starting motors can be identified. The function of starting motor components can be given. The effect of multi-pole/winding/shunt wiring arrangements on starting motor performance can be explained.

Criteria 18.31A.1.3

Cranking motor drive mechanism correctly performance tested.

Assessor guide: observe that –

The cranking motor drive mechanism is safely tested for correct operation in accordance with standard operating procedures.

Assessor guide: confirm that –

The tests that can be used to check the performance of the cranking motor drive mechanism can be identified. The test procedures can be given. The hazards associated with testing the performance of cranking motor drive mechanisms can be identified.

Criteria 18.31A.1.4

Starter locked armature current, voltage and torque correctly determined.

Assessor guide: observe that –

Assessor guide: confirm that –

The concept of "locked armature" can be explained in terms of current, voltage and torque. The starter locked armature specifications can be identified. The procedures for determining locked armature current, voltage and torque can be given. The tools and equipment necessary to determine starter locked armature current, voltage and torque can be identified.

Element 18.31A.2 Test and repair starting motors**Criteria 18.31A.2.1**

Starting motors dismantled and assembled according to manufacturer's recommendations.

Assessor guide: observe that –

Given starting motors can be dismantled and assembled in accordance with manufacturer's recommendations/procedures using appropriate tools, techniques and equipment.

Assessor guide: confirm that –

The manufacturer's recommended dismantling/assembling procedures for given starting motors can be identified. The tools and equipment necessary to dismantle/assemble starting motors can be identified.

Criteria 18.31A.2.2

Testing performed to determine shorts to ground, turn shorts, winding continuity, etc.

Assessor guide: observe that –

Given starting motors are checked for electrical faults in accordance with standard operating procedures.

Assessor guide: confirm that –

The range of electrical tests that can be applied to starting motors can be identified. The purpose of each of these tests can be explained. The equipment required to carry out the tests can be identified. The electrical testing procedures can be given.

Criteria 18.31A.2.3

Solenoid, relays and over-temperature devices correctly tested.

Assessor guide: observe that –

For given starting motors, the solenoids, relays and over-temperature devices are tested for conformance to specification using appropriate techniques and equipment in accordance with standard operating procedures.

Assessor guide: confirm that –

The function of solenoids, relays and over-temperature devices can be explained. The procedures for testing solenoids, relays and over-temperature devices for correct operation can be identified. The operational specifications of the solenoids, relays and over-temperature devices can be identified.

Criteria 18.31A.2.4

Starter engagement mechanism is tested and adjusted where possible ie: pinion clearance.

Assessor guide: observe that –

For the given starting motor, the engagement mechanism is checked for correct operation and conformance with specifications in accordance with standard operating procedures. Where appropriate the starter engagement mechanism is adjusted to specification in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for testing and adjusting starter engagement mechanisms can be given. The specifications of the starter engagement mechanism can be identified.

Criteria 18.31A.2.5

Starting system free of excessive voltage drops.

Assessor guide: observe that –

For given starting motors, the starting system is checked for excessive voltage drops in accordance with standard operating procedure.

Assessor guide: confirm that –

The effect of voltage drops on starting system operation/performance can be explained. The causes of voltage drops in the starting system can be given. The procedures for checking starting systems for excessive voltage drops can be given.

Criteria 18.31A.2.6

Starting and charging circuit connections are correctly made, tightened and insulated.

Assessor guide: observe that –

For given starting motors, all circuit connections are checked for conformance to specifications in accordance with standard operating procedures.

Assessor guide: confirm that –

The effect of loose, poorly joined and/or inappropriate insulation on starting motor performance/operation can be explained. The specifications of all circuit connections can be identified.

Criteria 18.31A.2.7

Starter locked armature current, voltage and torque correctly determined.

Assessor guide: observe that –

The repaired/overhauled starting motor is tested to ensure that the locked armature current, voltage and torque conform to specifications.

Assessor guide: confirm that –

Range statement

This unit covers engine electrical starting systems and would require extensive use of AVR test equipment. Starting motors include axial and coaxial type starters with drive arrangements such as Dyer, Positork, Sprag clutch, over running clutch and inertia drive. If soldering of wires is required see Unit 5.1A (Manual soldering/desoldering - electrical/electronic components).

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the diagnosis and repair of low voltage starting systems or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 18.32A A Maintain and repair induction/exhaust systems

Band – Specialisation band A

Field – Maintenance & diagnostics

Unit Weight 4

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices
18.2A Use power tools/hand held operations

9.1A Draw and interpret sketch
18.55A Dismantle, replace and assemble engineering components

18.1A Use hand tools

Pre-requisite units - Path 2

2.5C11 Measure with graduated devices
18.2A Use power tools/hand held operations

9.2A Interpret technical drawing
18.55A Dismantle, replace and assemble engineering components

18.1A Use hand tools

Element 18.32A.1 Assess induction/exhaust system operation

Criteria 18.32A.1.1

Supercharging, filtering, inter/after cooling principles, terminology and applications are understood.

Assessor guide: observe that –

Assessor guide: confirm that –

The principles of supercharging, filtering, inter and after cooling can be explained using appropriate terminology. A variety of applications of supercharging, filtering inter and after cooling can be identified.

Criteria 18.32A.1.2

Relevant information is obtained and correctly interpreted prior to any testing.

Assessor guide: observe that –

All relevant instructions, drawings, specifications, catalogues and manufacturer's documentation are obtained in accordance with workplace procedures.

Assessor guide: confirm that –

The performance and operational specifications of the induction/exhaust system can be identified.

Criteria 18.32A.1.3

Checks undertaken safely and to prescribed procedures.

Assessor guide: observe that –

The induction/exhaust system is safely checked for correct operation in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for testing induction/exhaust systems for correct operation can be identified. The safety precautions to be followed when testing induction/exhaust systems can be identified.

Criteria 18.32A.1.4

Flows, pressures, temperatures correctly determined and recorded.

Assessor guide: observe that –

The flows, pressures and temperatures of the given induction/exhaust system are accurately determined using appropriate techniques and equipment in accordance with standard operating procedures. Where appropriate, flows, pressures and temperatures are recorded in accordance with standard operating procedures.

Assessor guide: confirm that –

The equipment necessary to test flows, pressures and temperatures can be identified. The procedures for testing flows, pressures and temperatures associated with induction/exhaust systems can be identified. The procedures for recording flows, pressures and temperatures can be given.

Criteria 18.32A.1.5

Faults are correctly isolated to component level and appropriate corrective action determined.

Assessor guide: observe that –

Where appropriate, the faulty component is isolated in accordance with standard operating procedures.

Assessor guide: confirm that –

Common faults associated with induction/exhaust systems can be identified. The causes of those common faults can be given. The procedures for correcting faults in induction/exhaust systems can be identified. The appropriate corrective action for a variety of common faults can be identified.

Criteria 18.32A.1.6

Test instruments and equipment used correctly.

Assessor guide: observe that –

All test instruments and equipment are used safely and correctly in accordance with standard operating procedures.

Assessor guide: confirm that –

Element 18.32A.2 Repair/replace faulty components**Criteria 18.32A.2.1**

Component wear and clearances correctly determined using manufacturer's recommendations.

Assessor guide: observe that –

Component parts are checked visually and dimensionally for wear in accordance with standard operating procedures.

Assessor guide: confirm that –

The component specifications/tolerances can be identified. The actions to be taken if the components are outside of specification can be identified. The action to be taken if the components are "just" within specification can be identified. For the given component(s) the action to be taken can be explained. The measuring instruments to be used to carry out dimensional checks on components can be identified.

<p>Criteria 18.32A.2.2 Replacement components correctly selected using manufacturer's data.</p>	<p><i>Assessor guide: observe that –</i> Where appropriate, replacement components are selected from supplier catalogues in conformance to manufacturer's specifications.</p>	<p><i>Assessor guide: confirm that –</i></p>
<p>Criteria 18.32A.2.3 Components removed and refitted to engine following prescribed procedures.</p>	<p><i>Assessor guide: observe that –</i> Components are removed from and fitted to engines safely in accordance with standard operating procedures.</p>	<p><i>Assessor guide: confirm that –</i> The procedures for removing/fitting components to engines can be identified. The safety precautions to be followed when removing/fitting components to engines can be identified.</p>
<p>Criteria 18.32A.2.4 Test and repair activities are accurately recorded.</p>	<p><i>Assessor guide: observe that –</i> All test and, where appropriate, repair activities, are recorded in accordance with standard operating procedures.</p>	<p><i>Assessor guide: confirm that –</i> The procedures for recording test and repair activities undertaken on induction/exhaust systems can be identified.</p>
<p>Criteria 18.32A.2.5 Engine free of air/exhaust leaks after repair work is carried out.</p>	<p><i>Assessor guide: observe that –</i> The induction/exhaust system is checked for leaks in accordance with standard operating procedures.</p>	<p><i>Assessor guide: confirm that –</i> The consequences of air/exhaust leaks on the safe operation of the induction/exhaust system can be explained. The procedures for testing for leaks in induction/exhaust systems can be identified.</p>

Range statement

Supercharging apparatus includes turbo charging equipment. Testing procedures would typically require the person to understand the operation of the apparatus installed to balance fuel injection to boost pressure; and control devices installed to prevent excessive turbocharger RPM and/or boost pressure. Typical faults would be associated with excessive air inlet restrictions, excessive exhaust back pressures, too much/little boost pressure, ineffective inter/after cooling, etc.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the maintenance and repair of induction/exhaust systems or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 18.33A A Perform engine bottom-end overhaul

Band – Specialisation band A

Field – Maintenance & diagnostics

Unit Weight 4

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices
18.2A Use power tools/hand held operations

9.1A Draw and interpret sketch
18.55A Dismantle, replace and assemble engineering components

18.1A Use hand tools

Pre-requisite units - Path 2

2.5C11 Measure with graduated devices
18.2A Use power tools/hand held operations

9.2A Interpret technical drawing
18.55A Dismantle, replace and assemble engineering components

18.1A Use hand tools

Element 18.33A.1 Dismantle, clean and assess parts

Criteria 18.33A.1.1

Characteristics of surface finishes and wear patterns associated with crankshaft and piston assemblies understood and parts correctly assessed for re-use or replacement.

Assessor guide: observe that –

All relevant parts lists, specifications, manuals and procedures are obtained in accordance with work place procedures.

Assessor guide: confirm that –

The characteristics of surface finishes and wear patterns as applied to crankshaft and piston assemblies can be described. The specifications of crankshaft and piston assemblies can be identified. Given components can be correctly identified for re-use or replacement. The reasons for identifying the components for re-use or replacement can be given.

Criteria 18.33A.1.2

Engine removed from plant, top end components removed and block assembly dismantled according to manufacturers recommendations.

Assessor guide: observe that –

The engine is removed from plant, top end components removed and block assembly dismantled in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for dismantling the block assembly can be given. The procedures for removing the engine from the plant can be given. The procedures for removing the top end from the engine can be given. The tools, techniques and equipment to be used can be identified. The reasons for selecting the chosen tools, techniques and equipment can be given. The hazards associated with the removal of engines/engine components can be identified.

Criteria 18.33A.1.3

Parts assessed for abnormal wear or defects.

Assessor guide: observe that –

All parts are checked for abnormal wear or defects.

Assessor guide: confirm that –

The action to be taken when abnormal wear or defects are observed in the engine components can be given.

Criteria 18.33A.1.4

Appropriate cleaning solution and procedure selected.

Assessor guide: observe that –

Parts are cleaned using appropriate solutions and procedures.

Assessor guide: confirm that –

The procedures for cleaning engine parts can be given. The cleaning solution to be used can be identified. The reasons for selecting the chosen cleaning solution can be given.

Criteria 18.33A.1.5

Parts racked or set out according to their original location in the engine.

Assessor guide: observe that –

Engine parts are racked or set out according to their original position in readiness for reassembly in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for racking and/or setting out of parts in readiness for reassembly can be given.

Criteria 18.33A.1.6

Characteristics of surface finishes and wear patterns associated with crankshaft and piston assemblies understood and parts correctly assessed for re-use or replacement.

Assessor guide: observe that –

Engine components are correctly assessed for re-use or replacement.

Assessor guide: confirm that –

Engine components not conforming to specification can be identified.

Element 18.33A.2 Record and interpret measurements**Criteria 18.33A.2.1**

Measurements are accurately obtained and recorded.

Assessor guide: observe that –

Measurements are accurately obtained and recorded in accordance with standard operating procedures.

Assessor guide: confirm that –

The measuring instruments to be used to measure engine components can be identified. The reasons for selecting the chosen measuring instruments can be given. The procedures for recording engine measurements can be given.

Criteria 18.33A.2.2

Readings correctly interpreted regarding replacement or re-use and appropriate under or oversize of replacement parts determined.

Assessor guide: observe that –

Assessor guide: confirm that –

The concept of under/over size of replacement parts can be explained. The replacement parts required can be correctly identified as being under or over size. The reasons for identifying replacement parts as under or over size can be given.

Element 18.33A.3 Recondition components**Criteria 18.33A.3.1**

Ridges, gaps, tapers, ovality, protrusions identified and necessary corrective action taken.

Assessor guide: observe that –

All ridges, gaps, tapers, protrusions and ovality are removed in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for removing ridges, gaps, tapers, ovality and protrusions can be given. The tools, techniques and equipment required to correct the above faults can be identified. The reasons for selecting the chosen tools, techniques and equipment can be given.

Criteria 18.33A.3.2

Tools and equipment correctly utilised.

Assessor guide: observe that –

All tools and equipment are correctly used.

Assessor guide: confirm that –

Criteria 18.33A.3.3

Components assembled according to manufacturers specifications.

Assessor guide: observe that –

Engine bottom end components are assembled in accordance with specification and standard operating procedures.

Assessor guide: confirm that –

The procedures for assembling engine bottom ends can be given. The precautions to be taken when assembling engine bottom ends can be identified.

Criteria 18.33A.3.4

Bearing clearances correctly determined by calculation or direct measurement.

Assessor guide: observe that –

Bearing clearances are determined using the appropriate method in accordance with standard operating procedures.

Assessor guide: confirm that –

The methods of determining bearing clearances can be identified. The reasons for selecting the chosen method can be given. Bearing clearances can be calculated. The procedure for determining bearing clearances can be given.

Range statement

This unit refers to work typically undertaken in a bottom end engine overhaul. It includes cylinder honing using hand held power tools, replacement of bearings, piston rings and similar activities but not major machining such as crankshaft grinding, cylinder boring and tunnel boring.

Evidence guide**Assessment context**

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the overhaul of engine bottom ends or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Special notes

During assessment the individual will - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 18.34A A Perform engine top-end overhaul

Band – Specialisation band A

Field – Maintenance & diagnostics

Unit Weight 8

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices

18.1A Use hand tools

18.6A Dismantle/repair/replace/assemble and fit engineering components

9.1A Draw and interpret sketch

18.2A Use power tools/hand held operations

18.55A Dismantle, replace and assemble engineering components

9.2A Interpret technical drawing

18.3A Use tools for precision work

Element 18.34A.1 Dismantle clean and assess parts

Criteria 18.34A.1.1

Characteristics of surface finishes and wear patterns associated with valve operating mechanisms and cylinder head understood.

Assessor guide: observe that –

All relevant parts lists, specifications, manuals and procedures are obtained in accordance with work place procedures.

Assessor guide: confirm that –

The characteristics of surface finishes and wear patterns as applied to valve operating mechanisms and cylinder heads. The specifications of valve operating mechanisms and cylinder heads can be identified. Given components can be correctly identified for re-use or replacement. The reasons for identifying the components for re-use or replacement can be given.

Criteria 18.34A.1.2

Cylinder head and ancillary components disassembled according to manufacturers recommendations.

Assessor guide: observe that –

The cylinder head and ancillary components are dismantled in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for dismantling cylinder heads and ancillary equipment can be given. The tools, techniques and equipment to be used can be identified. The reasons for selecting the chosen tools, techniques and equipment can be given. The hazards associated with the removal of cylinder heads and ancillary equipment can be identified.

Criteria 18.34A.1.3

Parts assessed for abnormal wear or defects.

Assessor guide: observe that –

All parts are checked for abnormal wear or defects.

Assessor guide: confirm that –

The action to be taken when abnormal wear or defects are observed in the engine components can be given.

Criteria 18.34A.1.4

Appropriate cleaning solution and procedure selected.

Assessor guide: observe that –

Parts are cleaned using appropriate solutions and procedures.

Assessor guide: confirm that –

The procedures for cleaning engine parts can be given. The cleaning solution to be used can be identified. The reasons for selecting the chosen cleaning solution can be given.

Criteria 18.34A.1.5

Parts correctly cleaned and stored ready for reassembly.

Assessor guide: observe that –

Parts are correctly cleaned and stored ready for reassembly.

Assessor guide: confirm that –

The procedures for storing parts in readiness for reassembly can be given.

Criteria 18.34A.1.6

Parts racked or set out according to their original location in the engine.

Assessor guide: observe that –

Engine parts are racked or set out according to their original position in readiness for reassembly in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for racking and/or setting out of parts in readiness for reassembly can be given can be given.

Element 18.34A.2 Record and interpret measurements**Criteria 18.34A.2.1**

Measurements accurately obtained and recorded using appropriate measuring equipment.

Assessor guide: observe that –

Measurements are accurately obtained and recorded in accordance with standard operating procedures.

Assessor guide: confirm that –

The measuring instruments to be used to measure engine components can be identified. The reasons for selecting the chosen measuring instruments can be given. The procedures for recording engine measurements can be given.

Criteria 18.34A.2.2

Parts replaced or reused, and appropriate under/over size of replacement parts determined.

Assessor guide: observe that –

Assessor guide: confirm that –

The concept of under/over size of replacement parts can be explained. The replacement parts required can be correctly identified as being under or over size. The reasons for identifying replacement parts as under or over size can be given.

Element 18.34A.3 Recondition cylinder head**Criteria 18.34A.3.1**

Cylinder head correctly pressure tested for serviceability.

Assessor guide: observe that –

The cylinder head is correctly pressure tested in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for pressure testing cylinder heads can be given. The tools, techniques and equipment to be used to pressure test cylinder heads can be given. The reasons for selecting the chosen tools, techniques and equipment can be given. The cylinder head specifications can be identified. The cylinder head can be identified as serviceable or requiring repair/ replacement. The reasons for identifying the cylinder head as serviceable or requiring repair/replacement can be given.

Criteria 18.34A.3.2

Spring tensions, valve and guide dimensions and surface flatness measured and recorded.

Assessor guide: observe that –

Spring tensions, valve and guide dimensions and surface flatness are measured and recorded in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for measuring spring tension, valve and guide dimensions and surface flatness can be given. The tools, techniques and equipment required to measure the above can be identified. The reasons for selecting the chosen tools, techniques and equipment can be given. The procedures for recording cylinder head and valve mechanism measurements can be given.

Criteria 18.34A.3.3

Cylinder head removed according to manufacturers specification.

Assessor guide: observe that –

The cylinder head is removed from the engine in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for removing the cylinder head from the engine can be given. The tools, techniques and equipment to be used in removing the cylinder head from the engine can be identified. The reasons for selecting the chosen tools, techniques and equipment can be given.

Criteria 18.34A.3.4

Grinding and cleaning equipment correctly utilised.

Assessor guide: observe that –

Valves and valve seats are ground in accordance with standard operating procedures. The cylinder head and ancillary equipment are cleaned using appropriate solutions in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for grinding valves and valve seats can be given. The tools, techniques and equipment required to grind valves and valve seats can be identified. The reasons for selecting the chosen tools, techniques and equipment can be given. The procedures for cleaning cylinder heads and ancillary equipment can be given. The solutions to be used to clean cylinder heads and ancillary equipment can be given. The reasons for selecting the chosen cleaning solution can be given.

Criteria 18.34A.3.5

Operational parameters of cylinder head components are understood and applied in determining whether components are reconditioned or replaced.

Assessor guide: observe that –

Cylinder head components are correctly identified for repair or replacement in accordance with standard operating procedures.

Assessor guide: confirm that –

The operational parameters of cylinder head components can be identified. Measurements taken are compared to specifications to determine serviceability of parts. Parts outside operational specifications are identified for repair/replacement. The reasons for identifying parts for repair/replacement can be given.

Criteria 18.34A.3.6

Injectors sleeves, sealing washers, plugs, cappings etc. replaced correctly.

Assessor guide: observe that –

All cylinder head components are replaced in accordance with specifications and standard operating procedures.

Assessor guide: confirm that –

The procedures for reassembling cylinder heads and their components can be given. The tools, techniques and equipment to be used to reassemble cylinder heads can be identified. The reasons for selecting the chosen tools, techniques and equipment can be given. The precautions to be taken when reassembling cylinder heads can be identified.

Range statement

This unit covers top-end overhaul of all types of engines and work associated with the reconditioning of cylinder heads including determining the causes of failures, replacement of inserts, guides and injector sleeves, grinding of valves and seats, crack/twist/bend testing etc. It includes both the reconditioning of original parts, crack repairs using non-welding techniques and sizing and fitting of replacement parts.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the overhaul of engine top ends or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 18.35A A Diagnose and repair braking systems

Band – Specialisation band A

Field – Maintenance & diagnostics

Unit Weight 6

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices
18.2A Use power tools/hand held operations

9.1A Draw and interpret sketch
18.55A Dismantle, replace and assemble engineering components

18.1A Use hand tools

Pre-requisite units - Path 2

2.5C11 Measure with graduated devices
18.2A Use power tools/hand held operations

9.2A Interpret technical drawing
18.55A Dismantle, replace and assemble engineering components

18.1A Use hand tools

Element 18.35A.1 Check and assess braking system

Criteria 18.35A.1.1

Friction and heat principles, braking system types, arrangements, components including anti-lock systems, functions, and applications understood.

Assessor guide: observe that –

Assessor guide: confirm that –

The principles of friction and heat as applied to braking systems can be explained. A variety of braking system types and arrangements can be identified. The function of the components of the braking systems can be identified. Typical applications of different types of braking systems can be given.

Criteria 18.35A.1.2

Braking system assessed for compliance with ADR regulations of appropriate standard.

Assessor guide: observe that –

The braking system is checked for compliance with ADR regulations in accordance with standard operating procedures.

Assessor guide: confirm that –

The requirements of the relevant Australian Design Rule applying to brakes can be identified. The procedures for checking braking systems for compliance with ADR regulations can be given.

Criteria 18.35A.1.3

Serviceability of friction materials correctly assessed.

Assessor guide: observe that –

Friction materials are checked for serviceability.

Assessor guide: confirm that –

Examples of worn and defective friction materials can be correctly identified from given samples. The specifications of the braking system can be identified. The friction material can be identified as being serviceable or to be replaced. The reasons for identifying the friction material as being serviceable or to be replaced can be given.

Criteria 18.35A.1.4

Braking system control devices assessed for compliance with specifications.

Assessor guide: observe that –

Assessor guide: confirm that –

Criteria 18.35A.1.5

Minimum operating dimensions measured, recorded and corrective action determined.

Assessor guide: observe that –

The brake operating dimensions are measured and recorded in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for measuring brake operating dimensions can be given. The tools, techniques and equipment to be used can be identified. The reasons for selecting the chosen tools, techniques and equipment can be given. The procedures for recording brake operating dimensions can be given. Any variation of brake operating measurement from specification can be identified. The corrective action to be taken can be identified. The reasons for identifying the chosen corrective action can be given.

Criteria 18.35A.1.6

Faults correctly diagnosed to component level and appropriate corrective action determined.

Assessor guide: observe that –

The operation of the braking system is checked for conformance to specification in accordance with standard operating procedures.

Assessor guide: confirm that –

Faulty braking system components can be identified. The corrective action to be taken can be identified. The reasons for identifying the chosen corrective action can be given. The procedures for checking braking system operation can be given.

Element 18.35A.2 Repair and overhaul braking system components**Criteria 18.35A.2.1**

Characteristics of surface finishes and wear patterns associated with braking components understood and measurements and part condition correctly interpreted when determining re-use/replacement.

Assessor guide: observe that –

All relevant parts lists, specifications, manuals and procedures are obtained in accordance with work place procedures.

Assessor guide: confirm that –

The characteristics of surface finishes and wear patterns as applied to braking system components can be described. The specifications of the braking system can be identified. Given components can be correctly identified for re-use/replacement. The reasons for identifying the components for re-use or replacement can be given.

Criteria 18.35A.2.2

Braking system components removed, disassembled and handled correctly.

Assessor guide: observe that –

Braking system components are removed, dismantled and handled correctly in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for removing and dismantling braking system components can be given. The precautions to be taken when handling braking systems components can be identified. The tools, techniques and equipment to be used in removing and dismantling braking system components can be identified. The reasons for selecting the chosen tools, techniques and equipment can be given.

Criteria 18.35A.2.3

Components cleaned using appropriate fluid and procedure.

Assessor guide: observe that –

Braking system components are cleaned using appropriate solutions in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for cleaning braking system components can be given. The solutions to be used when cleaning braking system components can be identified. The reasons for selecting the chosen cleaning fluid can be given.

Criteria 18.35A.2.4

Friction material to reaction member clearance adjusted to specification.

Assessor guide: observe that –

The brake clearance is adjusted in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedure for adjusting brake clearances can be given.

Criteria 18.35A.2.5 Tooling and equipment correctly applied.	<i>Assessor guide: observe that –</i> All tools and equipment are used appropriately.	<i>Assessor guide: confirm that –</i>
Criteria 18.35A.2.6 Hydraulic/air/vacuum system free of leaks/restrictions after repair work.	<i>Assessor guide: observe that –</i> The hydraulic/air/vacuum system is free of leaks/restrictions.	<i>Assessor guide: confirm that –</i> The procedures for checking for hydraulic, air and vacuum system leaks and restrictions can be given.
Criteria 18.35A.2.7 All levers, linkages and pedal clearances adjusted to specifications.	<i>Assessor guide: observe that –</i> All levers, linkages and pedal clearances are adjusted in accordance with specification and standard operating procedures.	<i>Assessor guide: confirm that –</i> The procedures for adjusting levers, linkages and pedal clearances can be given.
Criteria 18.35A.2.8 Braking system re-commissioned and tested according to manufacturers recommendations or appropriate standard/regulation.	<i>Assessor guide: observe that –</i> The braking system is tested for conformance with specifications/ regulations in accordance with standard operating procedures. The braking system is recommissioned in accordance with standard operating procedures.	<i>Assessor guide: confirm that –</i> The procedures for recommissioning the braking system can be given. The procedures for testing braking systems can be given. The tests to be carried out on the braking system can be identified. The tools, techniques and equipment required to test the braking system can be given. The reasons for selecting the chosen tools, techniques and equipment can be given.

Range statement

This unit covers braking systems associated with mobile equipment including mechanical, hydraulic, air and electrically operated types. Arrangements may include drum/disc wheel/track brakes; anti locking braking systems; transmission brakes and service; park and emergency brakes.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the diagnosis and repair of braking systems or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 18.36B A Maintain and repair scientific analysis equipment

Band – Specialisation band B

Field – Maintenance & diagnostics

Unit Weight 10

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices

9.2A Interpret technical drawing

18.2A Use power tools/hand held operations

18.57A Maintain/service analog/digital electronic equipment

5.1A Manual soldering/desoldering - electrical/electronic components

12.4A Precision electrical/electronic measurement

18.54A Fault find, test, calibrate instrumentation systems, equipment

18.62A Install, maintain and calibrate instrumentation sensors, transmitters and final control elements

9.1A Draw and interpret sketch

18.1A Use hand tools

18.55A Dismantle, replace and assemble engineering components

18.69B Maintain, repair instrumentation process control analysers

Pre-requisite units - Path 2

2.5C11 Measure with graduated devices

12.2A Electrical/electronic measurement

18.54A Fault find, test, calibrate instrumentation systems, equipment

18.69B Maintain, repair instrumentation process control analysers

9.1A Draw and interpret sketch

18.1A Use hand tools

18.55A Dismantle, replace and assemble engineering components

9.2A Interpret technical drawing

18.2A Use power tools/hand held operations

18.64A Maintain instrumentation system components

Element 18.36B.1 Perform preventative maintenance tasks on scientific analysis equipment

Criteria 18.36B.1.1

Determine specification requirements from manufacturers' manuals, maintenance schedules and other relevant documents.

Assessor guide: observe that –

All relevant manufacturers' manuals, maintenance schedules and documentation are obtained in accordance with work place procedures.

Assessor guide: confirm that –

The specifications of the scientific analysis equipment can be identified.

Criteria 18.36B.1.2

Using knowledge of characteristics of scientific analysis equipment and principles of operation, specification requirements interpreted, defined and understood.

Assessor guide: observe that –

Assessor guide: confirm that –

The principles of operation of the scientific analysis equipment can be identified. The application(s) of the scientific analysis equipment can be identified. The effects on the results of scientific analysis undertaken with equipment outside of its operational specifications can be explained.

Criteria 18.36B.1.3

Using sound working knowledge of the characteristics and principles of operation, preventative maintenance schedules are performed on scientific analysis equipment to service and maintain at optimum operating condition.

Assessor guide: observe that –

For given scientific analysis equipment, preventative maintenance is carried out in accordance with standard operating procedures.

Assessor guide: confirm that –

The benefits of preventative maintenance strategies with respect to scientific analysis equipment can be explained. The preventative maintenance procedures for given scientific analysis equipment can be identified.

Criteria 18.36B.1.4

Using correct electrical and electronic test equipment, techniques and procedures, specified scientific analysers are diagnosed within the system or within the laboratory to determine correct operation or malfunction.

Assessor guide: observe that –

Given scientific analysis equipment is checked for correct operation using appropriate test equipment, techniques and procedures.

Assessor guide: confirm that –

The application of a range of electrical and electronic test equipment can be identified. The techniques and procedures to be used when testing scientific analysis equipment can be identified.

Criteria 18.36B.1.5

Determine specification requirements from manufacturers' manuals, maintenance schedules and other relevant documents.

Assessor guide: observe that –

Assessor guide: confirm that –

Criteria 18.36B.1.6

Using appropriate electrical/electronic test equipment and procedures, correct operation of analysers is tested, and/or fault condition identified, localised and monitored.

Assessor guide: observe that –

The given scientific analysis equipment is monitored for correct operation/malfunction using appropriate test equipment, techniques and procedures. Where appropriate, the malfunction is localised in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for localising detected malfunctions can be identified. The reasons for monitoring apparent correct operation or malfunction can be explained. Common causes of scientific analysis equipment malfunction can be identified.

Criteria 18.36B.1.7

Correct operation confirmed and/or faults and malfunctions identified and confirmed.

Assessor guide: observe that –

For the given scientific analysis equipment, correct operation/ malfunction is confirmed in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for confirming correct operation/malfunction of scientific analysis equipment can be identified.

Element 18.36B.2 Complete fault documentation**Criteria 18.36B.2.1**

Faults and malfunctions documented or reported to standard operating procedures.

Assessor guide: observe that –

Where appropriate, faults/malfunctions are recorded/documentated in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for recording/documenting faults/malfunctions in scientific analysis equipment can be identified.

Element 18.36B.3 Plan corrective action**Criteria 18.36B.3.1**

Corrective action planned autonomously or in consultation with appropriate personnel and actioned.

Assessor guide: observe that –

Assessor guide: confirm that –

The role of the individual in the planning of any corrective action to be taken with respect to scientific analysis equipment can be identified. The sequential steps in carrying out any required corrective action can be identified. The reasons for selecting the chosen sequence of events can be explained.

Element 18.36B.4 Repair, replace, overhaul scientific analysis equipment**Criteria 18.36B.4.1**

Scientific analysis equipment examined and verified for repair, replacement or overhaul using correct equipment/tools and appropriate principles, techniques and procedures.

Assessor guide: observe that –

Given scientific analysis equipment is examined using appropriate tools, equipment, techniques, principles and procedures. Where appropriate, faulty/ malfunctioning components are identified for repair, replacement or overhaul using appropriate tools, equipment, techniques, principles and procedures.

Assessor guide: confirm that –

The specification of the components to be repaired, replaced or overhauled can be identified. The tools and equipment to be used in the repair, replacement or overhaul of scientific analysis equipment componentry can be identified. The principles, techniques and procedures to be followed in the repair, replacement or overhaul of scientific analysis equipment components can be given. The reasons for repairing, overhauling or replacing the faulty components can be given.

Criteria 18.36B.4.2

Replacement items selected from manufacturers' parts lists or catalogues according to specifications required.

Assessor guide: observe that –

All relevant suppliers' catalogues are obtained in accordance with work place procedures.

Assessor guide: confirm that –

Replacement components are selected from suppliers' catalogues in conformance to nominated specifications.

Criteria 18.36B.4.3

Replacement items obtained by appropriate means.

Assessor guide: observe that –

Where appropriate, replacement items are obtained in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for obtaining replacement components can be given.

Criteria 18.36B.4.4

Faulty items repaired or overhauled using correct principles, techniques, equipment/tools and procedures.

Assessor guide: observe that –

Given faulty items are repaired or overhauled using appropriate tools, equipment, techniques, principles and procedures.

Assessor guide: confirm that –

Examples of common items that can be repaired or overhauled can be identified. The tools, equipment and techniques to be used in the repair/overhaul of faulty components can be identified. The principles and procedures to be followed when repairing/overhauling faulty components can be identified.

Criteria 18.36B.4.5

Repaired, overhauled and replacement items prepared for refitting according to standard workshop procedures.

Assessor guide: observe that –

Components to be refitted/fitted into scientific analysis equipment are prepared in accordance with specifications and standard operating procedures.

Assessor guide: confirm that –

The preparation requirements of items to be refitted/fitted into scientific analysis equipment can be identified.

Criteria 18.36B.4.6

Scientific analysis equipment refitted using correct principles, tools, equipment and procedures.

Assessor guide: observe that –

Components of scientific analysis equipment are refitted/fitted using appropriate tools, equipment, techniques, principles and procedures.

Assessor guide: confirm that –

The procedures for refitting/fitting components into scientific analysis equipment can be identified.

Criteria 18.36B.4.7

Refitted scientific analysers prepared for testing and calibration.

Assessor guide: observe that –

Given refitted scientific analysis equipment is prepared for testing and calibration in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for preparing scientific analysis equipment for testing and calibration can be identified. The reasons for preparing scientific analysis equipment for testing and calibration can be explained.

Element 18.36B.5 Calibrate and test scientific analysis equipment**Criteria 18.36B.5.1**

Scientific analysis equipment calibrated against physical standards using correct calibration devices, equipment, techniques and procedures.

Assessor guide: observe that –

The given scientific analysis equipment is correctly calibrated against the physical standard using appropriate devices, equipment, techniques and procedures.

Assessor guide: confirm that –

The appropriate physical standard against which the scientific analysis equipment is to be calibrated can be identified. The procedures for calibrating scientific analysis equipment can be identified. The devices, equipment and techniques to be followed in calibrating scientific analysis equipment can be identified.

Criteria 18.36B.5.2

Calibrated scientific analysers tested using appropriate test equipment including electrical and electronic test equipment.

Assessor guide: observe that –

Calibrated scientific analysis equipment is tested for conformance with specifications using appropriate test equipment, techniques and procedures.

Assessor guide: confirm that –

The test procedures to be applied to calibrated scientific analysis equipment can be identified. The equipment to be used to test calibrated scientific analysis equipment can be identified. The reasons for testing calibrated scientific analysis equipment can be explained.

Criteria 18.36B.5.3

Calibration and analysis data collected by appropriate means.

Assessor guide: observe that –

Calibration and test data is recorded in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for recording calibration and calibration test data can be identified.

Criteria 18.36B.5.4

Calibration and analysis data interpreted and understood.

Assessor guide: observe that –

Assessor guide: confirm that –

Where appropriate, trends, variations, fluctuations etc. in calibration and test data identified. The probable causes of trends, variations and fluctuations detected can be explained.

Criteria 18.36B.5.5

Calibration and analysis data assessed in accordance with manufacturers' data sheets, codes of practice and safety procedures.

Assessor guide: observe that –

The test and calibration data is compared with the scientific analysis equipment operational specifications.

Assessor guide: confirm that –

The operational specifications of the scientific analysis equipment can be identified. The procedures for dealing with test and calibration data within/outside specifications can be identified.

Element 18.36B.6 Re-install and recommission scientific analysis equipment**Criteria 18.36B.6.1**

Scientific analysis equipment put into service.

Assessor guide: observe that –

Given scientific analysis equipment is recommissioned in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for recommissioning scientific analysis equipment can be identified. All necessary connections and precautions to be taken during recommissioning can be identified.

Criteria 18.36B.6.2

Service reports completed to standard operating procedures.

Assessor guide: observe that –

All necessary service reports are completed in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for reporting completed servicing/maintenance on scientific analysis equipment can be identified.

Element 18.36B.7 Service reports completed**Criteria 18.36B.7.1**

Service reports completed using appropriate means.

Assessor guide: observe that –

All necessary service reports are completed in accordance with standard operating procedures.

Assessor guide: confirm that –

Range statement

Work undertaken autonomously or in a team environment, using predetermined standards of quality, safety and workshop procedures. Tasks performed in laboratory, workshop or on-site environments using electrical and electronic test equipment. Extends to the interpretation of electrical and electronic circuit diagrams; the use of specific calibration devices for laboratory and process analysers employing the principles of spectrometry (infra-red, visible, ultraviolet) both dispersive and non-dispersive, chromatography (gas, liquid), optical refraction, atomic radiation and x-rays. Tasks involve laboratory, workshop and site work safely utilising solid, liquid and gaseous samples for calibration, electronic test equipment, associated tools, calibration charts, laboratory data and manufacturers' data sheets. Employs the use of high pressure gas cylinders, liquid chemicals and associated equipment during calibration. The interpretation of operating sequences for program operated devices is included. Where high reliability soldering and desoldering is required Unit 5.2A (High reliability soldering and desoldering) should be selected.

Evidence guide

Assessment context

This unit should be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the maintenance and repair of scientific analysis equipment or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 18.37A A Diagnose and repair low voltage charging systems

Band – Specialisation band A

Field – Maintenance & diagnostics

Unit Weight 2

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices

9.1A Draw and interpret sketch

18.1A Use hand tools

18.2A Use power tools/hand held operations

18.30A Diagnose and repair low voltage electrical systems

18.55A Dismantle, replace and assemble engineering components

Element 18.37A.1 Assess generator/alternator operation

Criteria 18.37A.1.1

Magnetism, induced voltage and electromagnetism principles understood.

Assessor guide: observe that –

Assessor guide: confirm that –

The concepts of magnetism, electromagnetism and induced voltage can be explained. The construction of generators and alternators can be identified. The principles of operation of generators and alternators can be explained.

Criteria 18.37A.1.2

Alternating and direct current generating principles; voltage/current regulation methods; and diode/condenser types and action understood.

Assessor guide: observe that –

Assessor guide: confirm that –

The methods of generating alternating and direct current for low voltage systems can be identified. The methods of regulating voltage and current generated can be identified. The function of diode and condenser types of regulator can be explained.

Criteria 18.37A.1.3

Charging system performance checked and variances from system specifications accurately recorded.

Assessor guide: observe that –

The charging system is safely tested for correct operation in accordance with standard operating procedures. Where appropriate, variations from system specifications are accurately recorded in accordance with standard operating procedures.

Assessor guide: confirm that –

The tests that can be used to check the performance of the charging system can be identified. The test procedures can be given. The hazards associated with the testing of the performance of charging systems can be identified. The charging system specifications can be identified. The test equipment to be used in checking low voltage charging systems can be identified. The procedures for recording charging system performance/variations from specifications can be identified.

Element 18.37A.2 Test and repair generators/alternators**Criteria 18.37A.2.1**

Generators/alternators dismantled and assembled correctly.

Assessor guide: observe that –

Given generators/alternators are correctly and safely dismantled and reassembled in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for dismantling and reassembling generators/alternators can be identified. The tools and equipment to be used in dismantling and reassembling generators/alternators can be identified. The safety precautions to be followed when working with generators/alternators can be given.

Criteria 18.37A.2.2

Charging faults determined to component level.

Assessor guide: observe that –

Charging faults in given generator/ alternator systems are safely identified in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for identifying charging faults can be identified. The test equipment to be used in identifying charging faults can be identified.

Criteria 18.37A.2.3

Testing performed to determine shorts to ground, turn shorts and winding continuity etc.

Assessor guide: observe that –

Short circuit and winding continuity tests are conducted in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for testing short circuits and winding continuity can be identified. The test equipment to be used in testing for short circuits and winding continuity can be identified.

Criteria 18.37A.2.4

Alternator/generator is tested for normal and maximum output.

Assessor guide: observe that –

The given alternator/generator output is tested for conformance to specification in accordance with standard operating procedures.

Assessor guide: confirm that –

The specifications of generator/ alternator output can be identified. The test equipment to be used to determine alternator/generator output can be identified. The procedures for testing alternator/generator output can be given.

Criteria 18.37A.2.5

Voltage and/or current regulators, cut-outs and relays are correctly tested and adjusted to specification.

Assessor guide: observe that –

Given voltage and current regulators, cut-outs and relays are tested for correct operation and conformance to specifications in accordance with standard operating procedures. Where appropriate, voltage and current regulators, cut-outs and relays are adjusted to specification in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for testing voltage and current regulators, cut-outs and relays can be identified. The methods of adjusting voltage and current regulators, cut-outs and relays can be given. The operational specifications of voltage and current regulators, cut-outs and relays can be identified. The test equipment to be used to check the operation of voltage and current regulators, cut-outs and relays can be identified.

Criteria 18.37A.2.6

Condition of power/exciter diodes correctly determined.

Assessor guide: observe that –

The condition of given power/exciter diodes is safely determined in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for testing diodes can be identified. The test equipment to be used to test diodes can be identified. The precautions to be taken when testing diodes can be given.

Criteria 18.37A.2.7

All faulty components are replaced according to manufacturers' recommendations ie: brush gear, bearings, diodes, contacts, relays, etc.

Assessor guide: observe that –

All relevant supplier catalogues are obtained in accordance with work place procedures. Where appropriate, faulty components are replaced in accordance with specifications and standard operating procedures.

Assessor guide: confirm that –

The components of generators/ alternators that can be replaced can be identified. The specifications of the faulty generator/alternator components can be identified.

Criteria 18.37A.2.8

Charging system free of excessive voltage drops and connections are correctly soldered, tightened and insulated.

Assessor guide: observe that –

The given generator/alternator charging system is checked for excessive voltage drops in accordance with standard operating procedures. The given generator/alternator charging system is checked to ensure all connections conform to specification in accordance with standard operating procedures.

Assessor guide: confirm that –

The effect of voltage drops on charging system operation/ performance can be explained. The causes of voltage drops in the charging system can be given. The procedures for checking charging systems for excessive voltage drops can be given. The effect of loose, poorly soldered and/or inappropriate insulation on charging system operation can be explained. The specifications of all circuit connections can be identified.

Range statement

This unit refers to a wide variety of generators, alternators and both electro-mechanical and specialist electronic regulating apparatus and applies to testing and repair activities associated with 12, 24 and 36 volt charging systems on vehicles, plant and stationary equipment. All work carried out to legislative and regulatory requirements. If specialist electronic skills are required, appropriate competency units should be selected. This unit should not be selected with any of the following units: 18.45A (Fault find/repair electrical equipment/components up to 240v single phase supply) or Unit 18.46A (Fault find/repair electrical equipment/components up to 1000vAC/1500vDC). If soldering of wires is required see Unit 5.1A (Manual soldering/desoldering - electrical/electronic components).

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the diagnosis and repair of low voltage (L.V.) charging systems or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 18.38A A Maintain and repair wheels and tyres

Band – Specialisation band A

Field – Maintenance & diagnostics

Unit Weight 2

Pre-requisite units - Path 1

18.1A Use hand tools

Element 18.38A.1 Assess wheel condition

Criteria 18.38A.1.1

Rim/tyre designs, constructions, codes, balancing, fastening principles and terminology understood.

Assessor guide: observe that –

Assessor guide: confirm that –

The design and construction of a variety of rims and tyres can be described. The principles of fastening and balancing of wheels can be given. The relevant codes and standards can be identified.

Criteria 18.38A.1.2

Fastening components correctly assessed for damage and security.

Assessor guide: observe that –

The wheel fastening components are checked for damage and security.

Assessor guide: confirm that –

Damaged fastening components can be identified from given samples. The procedures for checking wheels for secure fastening can be given. The reasons for checking fastening components for damage and security can be given.

Criteria 18.38A.1.3

Abnormal tyre wear recognised and cause of fault correctly determined.

Assessor guide: observe that –

Assessor guide: confirm that –

Abnormal tyre wear can be identified from given samples. The causes of abnormal tyre wear can be identified. The reasons for identifying the chosen cause of tyre wear can be given.

Criteria 18.38A.1.4

Unsafe tyre and/or wheel condition recognised and remedial action determined.

Assessor guide: observe that –

Assessor guide: confirm that –

Examples of unsafe tyre and wheel condition can be identified. The causes of the unsafe tyre and wheel conditions can be identified. The corrective action to be taken can be identified.

Element 18.38A.2 Repair and maintain wheel

Criteria 18.38A.2.1

Safety procedures associated with tyre/wheel removal, handling, inflation, assembly and disassembly, and fastening understood and adhered to.

Assessor guide: observe that –

Assessor guide: confirm that –

The procedures for removing, handling, inflating, assembling/ disassembling and fastening of tyres and wheels can be given. The safety precautions to be taken when working with wheels and tyres can be identified. The tools, techniques and equipment required to carry out the above procedures can be identified. The reasons for identifying the chosen tools, techniques and equipment can be given.

Criteria 18.38A.2.2

Wheels/tyres safely removed and replaced using standard procedures and appropriate tools and equipment.

Assessor guide: observe that –

Wheels/tyres are safely removed and replaced using appropriate tools and equipment in accordance with standard operating procedures.

Assessor guide: confirm that –

Criteria 18.38A.2.3

Tools and equipment correctly applied and utilised.

Assessor guide: observe that –

All tools and equipment are correctly and appropriately used.

Assessor guide: confirm that –

Criteria 18.38A.2.4

Ballasting and/or inflation of tyres performed safely and to specification.

Assessor guide: observe that –

Ballasting and/or inflation of tyres is undertaken safely in accordance with standard operating procedures.

Assessor guide: confirm that –

Criteria 18.38A.2.5

Static/dynamic balancing of wheels performed to specification.

Assessor guide: observe that –

Wheels are balanced to specification in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for static and dynamic balancing of wheels can be given. The tools, techniques and equipment to be used for balancing can be identified. The reasons for selecting the chosen tools, techniques and equipment can be given.

Criteria 18.38A.2.6

Rim/tyre/tube faults repaired to specifications, regulations or codes.

Assessor guide: observe that –

Faults in rims/tyres/tubes are repaired to specification in accordance with standard operating procedures.

Assessor guide: confirm that –

Repairable rim, tyre and tube faults can be identified. The procedures for repairing these faults can be given. The tools, techniques and equipment to be used to repair the above faults can be identified. The reasons for selecting the tools, techniques and equipment chosen can be given. Examples of unrepairable rim, tyre and tube faults can be given.

Criteria 18.38A.2.7

Repair activities accurately recorded.

Assessor guide: observe that –

All repair activities are recorded in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for recording repairs undertaken on rims, tyres and tubes can be given.

Criteria 18.38A.2.8

Wheel bearings are correctly lubricated to specification.

Assessor guide: observe that –

Wheel bearings are lubricated in accordance with specification and standard operating procedures.

Assessor guide: confirm that –

The procedures for lubricating wheel bearings can be given. Types of wheel bearing lubricant and their application can be identified.

Range statement

This unit applies to the basic maintenance and repair of wheel rims and to the full range of wheel/tyre assemblies, plant and equipment using appropriate regulations, codes of practice, manufacturers' specifications or in-house standards as a guide for assessment repair and assembly. For complex rim repairs appropriate fitting or welding units may be required, for example, Unit 18.3A (Use tools for precision work) and Unit 18.6A (Dismantle/repair/replace/assemble and fit engineering components).

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the maintenance and repair of wheels and tyres or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 18.39A A Diagnose and repair track type undercarriage

Band – Specialisation band A

Field – Maintenance & diagnostics

Unit Weight 4

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices
18.2A Use power tools/hand held operations

9.1A Draw and interpret sketch
18.55A Dismantle, replace and assemble engineering components

18.1A Use hand tools

Pre-requisite units - Path 2

2.5C11 Measure with graduated devices
18.2A Use power tools/hand held operations

9.2A Interpret technical drawing
18.55A Dismantle, replace and assemble engineering components

18.1A Use hand tools

Element 18.39A.1 Assess track assembly

Criteria 18.39A.1.1

Track type undercarriage operating principles and terminology understood.

Assessor guide: observe that –

Assessor guide: confirm that –

The operating principles of track type undercarriage can be explained.

Criteria 18.39A.1.2

Links, pins, sprockets, idlers, rollers, pads, etc assessed for wear/damage/re-use/replacement; and corrective action determined.

Assessor guide: observe that –

All relevant specifications, parts lists, manuals, procedures, etc are obtained in accordance with work place procedures. Track type undercarriage components are checked for wear and damage using appropriate tools, techniques and equipment in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for checking track type undercarriage components for wear can be given. The tools, techniques and equipment required to check track type undercarriage components for wear can be identified. The reasons for selecting the chosen tools, techniques and equipment can be given. The specifications of the rack type undercarriage components can be identified. Worn or damaged components can be identified for repair or replacement. The reasons for identifying components for repair and replacement can be given. The action to be taken to overcome the wear and/or damage detected can be identified.

Criteria 18.39A.1.3

Track frame alignment checked and variances from specifications correctly determined.

Assessor guide: observe that –

The track frame is checked for alignment in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for aligning track frames can be given. The tools, techniques and equipment required to align track frames can be identified. The reasons for selecting the chosen tools, techniques and equipment can be given. Variations from alignment specifications can be identified.

Element 18.39A.2 Repair and maintain track assemblies**Criteria 18.39A.2.1**

Safety procedures associated with removal and replacement of track undercarriage components followed.

Assessor guide: observe that –

Track undercarriage components are safely removed and replaced in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for removing and replacing track type undercarriage components can be given. The precautions to be taken when removing and replacing track type undercarriage components can be identified.

Criteria 18.39A.2.2

Track tension correctly set to specification.

Assessor guide: observe that –

Track tension is correctly set to specification in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for setting track tension can be given.

Criteria 18.39A.2.3

Clearances adjusted to specification.

Assessor guide: observe that –

Clearances are adjusted to specification in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for adjusting clearances can be given.

Range statement

This unit also refers to mobile plant equipment that utilise crawler belts and/or chain link.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the diagnosis and repair of track type undercarriage or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 18.40A A Maintain and repair suspension systems

Band – Specialisation band A

Field – Maintenance & diagnostics

Unit Weight 4

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices
18.2A Use power tools/hand held operations

9.1A Draw and interpret sketch
18.55A Dismantle, replace and assemble engineering components

18.1A Use hand tools

Pre-requisite units - Path 2

2.5C11 Measure with graduated devices
18.2A Use power tools/hand held operations

9.2A Interpret technical drawing
18.55A Dismantle, replace and assemble engineering components

18.1A Use hand tools

Element 18.40A.1 Assess suspension systems

Criteria 18.40A.1.1

Steering geometry, alignment, suspension systems operation and terminology understood.

Assessor guide: observe that –
All relevant specifications, parts lists, manuals and procedures are obtained in accordance with standard operating procedures.

Assessor guide: confirm that –
The operation of suspension systems and the effects of steering geometry and alignment can be described.

Criteria 18.40A.1.2

Components assessed for security, wear and faults and corrective action determined.

Assessor guide: observe that –
The suspension components are checked for wear, faults and security in accordance with standard operating procedures.

Assessor guide: confirm that –
The procedures for checking suspension system components for wear, faults, security and conformance to specification can be given. The tools, techniques and equipment to be used to check/test suspension systems can be identified. The reasons for selecting the chosen tools, techniques and equipment can be given. The action to be taken to correct non-conformance to specification can be identified. The reasons for identifying the action to be taken can be explained.

Criteria 18.40A.1.3

Spring arrangements, control arms/links, dampening and control devices tested for correct operation.

Assessor guide: observe that –

Spring arrangements, control arms/ links and dampening devices are tested for correct operation in accordance with standard operating procedures.

Assessor guide: confirm that –

Criteria 18.40A.1.4

Axle alignment/tracking assessed and variance from specification determined.

Assessor guide: observe that –

Axle alignment/tracking is checked for conformance to specification in accordance with standard operating procedures.

Assessor guide: confirm that –

Variances of axle alignment from specification can be identified.

Criteria 18.40A.1.5

Auto/manual levelling devices performance tested.

Assessor guide: observe that –

Automatic/manual levelling devices are tested for correct operation in accordance with standard operating procedures.

Assessor guide: confirm that –

Element 18.40A.2 Maintain and repair suspension systems**Criteria 18.40A.2.1**

Axles aligned to specification.

Assessor guide: observe that –

Axles are aligned to specification in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for aligning axles can be given. The axle alignment specifications can be identified. The tools, techniques and equipment required to maintain and repair suspension systems can be identified. The reasons for selecting the chosen tools, techniques and equipment can be given.

Criteria 18.40A.2.2

Ride height adjusted to specification.

Assessor guide: observe that –

The ride height is adjusted to specification in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for adjusting ride height can be given. The ride height specifications can be identified.

Criteria 18.40A.2.3

Suspension system re-gassed to specification.

Assessor guide: observe that –

The suspension system is re-gassed to specification in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures to be followed in re-gassing suspension systems can be given. The precautions to be taken when re-gassing suspension systems can be identified.

Criteria 18.40A.2.4

Suspension components safely removed and replaced according to standard procedures.

Assessor guide: observe that –

Suspension components are safely removed and replaced in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for the removal and replacement of suspension systems can be given. The precautions to be taken when removing/replacing suspension systems can be identified.

Range statement

This unit applies to maintenance and repair activities associated with suspension systems of all types of wheeled and/or tracked plant/vehicles'.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the maintenance and repair of suspension systems or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 18.41A A Maintain and repair steering systems

Band – Specialisation band A

Field – Maintenance & diagnostics

Unit Weight 4

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices
18.2A Use power tools/hand held operations

9.1A Draw and interpret sketch
18.55A Dismantle, replace and assemble engineering components

18.1A Use hand tools

Pre-requisite units - Path 2

2.5C11 Measure with graduated devices
18.2A Use power tools/hand held operations

9.2A Interpret technical drawing
18.55A Dismantle, replace and assemble engineering components

18.1A Use hand tools

Element 18.41A.1 Assess steering system operation

Criteria 18.41A.1.1

Relevant information is obtained and correctly interpreted prior to any testing.

Assessor guide: observe that –
All relevant specifications, parts lists, manuals and procedures are obtained in accordance with standard operating procedures.

Assessor guide: confirm that –
The operation of the steering system and its components can be described.

Criteria 18.41A.1.2

Performance tests undertaken on primary and/or emergency steering systems safely and to prescribed procedures.

Assessor guide: observe that –
The steering system is tested for correct performance in accordance with standard operating procedures.

Assessor guide: confirm that –
The procedures for testing steering system performance can be given. The tests to be undertaken can be identified. The tools, techniques and equipment necessary to maintain and repair steering systems can be identified. The reasons for selecting the chosen tools, techniques and equipment can be given. The precautions to be taken when testing steering systems can be given.

Criteria 18.41A.1.3

Flows, pressures, alignment angles correctly determined and recorded.

Assessor guide: observe that –
All test results and measurements are recorded in accordance with standard operating procedures.

Assessor guide: confirm that –
The procedures for recording test results can be given.

Criteria 18.41A.1.4

Faults are correctly isolated to component level and appropriate corrective action determined.

Assessor guide: observe that –

Assessor guide: confirm that –

The faulty components can be identified. The corrective action to be taken can be identified. The reasons for selecting the chosen corrective action can be given.

Criteria 18.41A.1.5

Power assisted steering component functions, wheel/axle alignment principles, terminology and applications understood.

Assessor guide: observe that –

Assessor guide: confirm that –

The operation of power assisted steering systems can be described. The effects of wheel/axle alignment on steering system operation can be explained.

Criteria 18.41A.1.6

Test equipment used correctly.

Assessor guide: observe that –

All test equipment is used correctly and appropriately in accordance with standard operating procedures.

Assessor guide: confirm that –

Element 18.41A.2 Repair/replace faulty components**Criteria 18.41A.2.1**

Component wear and clearances correctly determined using appropriate test equipment and manufacturers recommendations.

Assessor guide: observe that –

Steering system components are measured using appropriate tools, techniques and equipment in accordance with standard operating procedures.

Assessor guide: confirm that –

The measuring equipment to be used can be identified. The reasons for selecting the chosen measuring equipment can be given. The procedures for checking components for wear and clearance can be given.

Criteria 18.41A.2.2

Replacement components correctly selected using manufacturers data.

Assessor guide: observe that –

Assessor guide: confirm that –

Replacement components can be selected using manufacturer's data.

Criteria 18.41A.2.3

Components removed and refitted following prescribed procedures.

Assessor guide: observe that –

Steering system components are removed and refitted in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for removing and refitting steering system components can be given. The precautions to be taken when removing and refitting steering system components can be identified.

Criteria 18.41A.2.4

Alignment adjustments made that bring wheel/axles in line with specifications.

Assessor guide: observe that –

Wheels and axles are aligned to specification in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for aligning wheels and axles can be given.

Criteria 18.41A.2.5

Test and repair activities accurately recorded.

Assessor guide: observe that –

Test and repair activities are accurately recorded in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for recording test and repair activities can be given.

Criteria 18.41A.2.6

Adjustments made to primary and/or emergency steering systems that bring system in line with specifications.

Assessor guide: observe that –

The steering system is adjusted in accordance with specifications and standard operating procedures.

Assessor guide: confirm that –

The procedures for adjusting primary and emergency steering systems can be given. The effect of adjustments on the steering system specifications can be given.

Range statement

This unit covers manual, hydraulically assisted, full hydraulic, articulated; and track type hydrostatic, clutch and differential type steering systems for vehicles, mobile plant and equipment.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the maintenance and repair of steering systems or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 18.42A B Diagnose and repair manual transmissions

Band – Specialisation band A

Field – Maintenance & diagnostics

Unit Weight 4

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices
18.2A Use power tools/hand held operations

9.1A Draw and interpret sketch
18.55A Dismantle, replace and assemble engineering components

18.1A Use hand tools

Pre-requisite units - Path 2

2.5C11 Measure with graduated devices
18.2A Use power tools/hand held operations

9.2A Interpret technical drawing
18.55A Dismantle, replace and assemble engineering components

18.1A Use hand tools

Element 18.42A.1 Assess clutch/transmission operation

Criteria 18.42A.1.1

Clutch and release mechanism types and principles of operation understood.

Assessor guide: observe that –

Assessor guide: confirm that –

The principles of operation of a variety of clutches can be given. The functions of the components of a variety of clutches can be identified.

Criteria 18.42A.1.2

Power flows, gear types and ratios, torque multiplication, synchronising and shifting principles understood.

Assessor guide: observe that –

Assessor guide: confirm that –

The principles of operation of manual transmissions can be explained. The concepts of gear ratios, torque multiplication and synchronisation can be explained.

Criteria 18.42A.1.3

Relevant information obtained and correctly interpreted prior to any testing.

Assessor guide: observe that –

Assessor guide: confirm that –

All relevant specifications, parts, lists, manuals and procedures are obtained in accordance with work place procedures.

Criteria 18.42A.1.4

Preliminary checks undertaken safely and to prescribed procedures.

Assessor guide: observe that –

Assessor guide: confirm that –

The clutch and transmission are checked for correct operation.

The procedures for checking clutches and transmissions for correct operation can be given.

Criteria 18.42A.1.5

Faults are correctly isolated to component level and appropriate corrective action determined.

Assessor guide: observe that –

Assessor guide: confirm that –

Faulty clutch and/or transmission components can be correctly identified. The appropriate action to correct the faulty component(s) can be identified. The reasons for selecting the chosen corrective action can be explained.

Criteria 18.42A.1.6

Test equipment adapted and used correctly.

Assessor guide: observe that –

Test equipment is used correctly in accordance with standard operating procedures.

Assessor guide: confirm that –

The test equipment to be used in checking/testing clutches and transmissions for correct operation can be identified. The reasons for selected the chosen test equipment can be given. The procedures for testing clutches and transmissions, including any necessary adaptation of test equipment, can be given.

Criteria 18.42A.1.7

Component parts correctly assessed for re-use or replacement.

Assessor guide: observe that –

Assessor guide: confirm that –

Component parts can be correctly identified for re-use or replacement. The reasons for identifying components to be re-used or replaced can be given.

Element 18.42A.2 Repair/replace faulty components**Criteria 18.42A.2.1**

Component wear and clearances correctly determined using appropriate test equipment and manufacturers recommendations.

Assessor guide: observe that –

The clutch/transmission components are tested for conformance to specification in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for checking clutch and transmission components for wear and clearance can be given. The tools, techniques and equipment to be used to determine component wear and clearance can be identified. The reasons for selecting the chosen tools, techniques and equipment can be given.

Criteria 18.42A.2.2

Replacement components correctly selected using manufacturers data.

Assessor guide: observe that –

Assessor guide: confirm that –

Replacement components can be identified using manufacturer's data.

Criteria 18.42A.2.3

Components removed and refitted to clutch/transmission assembly following prescribed procedures.

Assessor guide: observe that –

Components are removed from and refitted to clutch/transmission assemblies in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for removing and refitting clutch and transmission components can be given.

Criteria 18.42A.2.4

Adjustments made correctly using appropriate tooling/equipment and manufacturers data.

Assessor guide: observe that –

Clutch and transmission components are correctly adjusted using appropriate tools, techniques and equipment.

Assessor guide: confirm that –

The procedures for adjusting clutch and transmission components can be given. The tools, techniques and equipment to be used to maintain and repair clutch and transmission assemblies can be identified. The reasons for selecting the chosen tools, techniques and equipment can be given. The effects of the adjustments on clutch and transmission operation can be explained.

Criteria 18.42A.2.5

Test and repair activities are accurately recorded.

Assessor guide: observe that –

Test and repair activities are accurately recorded in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for recording test and repair activities can be given.

Criteria 18.42A.2.6

Clutch/transmission assembly free of excessive noise and operates to specification after repair work is carried out.

Assessor guide: observe that –

The clutch/transmission assembly is free of excessive noise and operates in conformance to specifications.

Assessor guide: confirm that –

The clutch/transmission assembly specifications can be identified.

Range statement

This unit covers diagnosis and repair activities associated with wheeled and/or tracked plant/vehicles, single/multi plate type clutch assemblies, counter shaft type transmissions, power take offs and transfer cases. Testing and assessment of performance would typically require operation of the plant or equipment. If hydraulic clutch assembly is used then competency Unit 18.18A (Maintain pneumatic system components) may need to be accessed.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the diagnosis and repair of manual transmissions or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 18.43A B Diagnose and repair automatic transmissions

Band – Specialisation band A

Field – Maintenance & diagnostics

Unit Weight 8

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices
18.2A Use power tools/hand held operations

9.1A Draw and interpret sketch
18.55A Dismantle, replace and assemble engineering components

18.1A Use hand tools

Pre-requisite units - Path 2

2.5C11 Measure with graduated devices
18.2A Use power tools/hand held operations

9.2A Interpret technical drawing
18.55A Dismantle, replace and assemble engineering components

18.1A Use hand tools

Element 18.43A.1 Assess converter/transmission operation

Criteria 18.43A.1.1

Torque converter, simple and compound planetary gearing, and hydraulic control operating principles understood.

Assessor guide: observe that –

Assessor guide: confirm that –

The principles of operation of automatic transmissions can be given. The function of torque converters, planetary gearing and hydraulic controls in automatic transmissions can be given.

Criteria 18.43A.1.2

Relevant information obtained and correctly interpreted prior to any testing.

Assessor guide: observe that –

All relevant specifications, parts, lists, manuals and procedures are obtained in accordance with work place procedures.

Assessor guide: confirm that –

Criteria 18.43A.1.3

Preliminary checks undertaken safely and to prescribed procedures.

Assessor guide: observe that –

The automatic transmission is checked for correct operation.

Assessor guide: confirm that –

The procedures for checking automatic transmissions for correct operation can be given.

Criteria 18.43A.1.4

Faults are correctly isolated to component level and appropriate corrective action determined.

Assessor guide: observe that –

Assessor guide: confirm that –

Faulty automatic transmission components can be correctly identified. The appropriate action to correct the faulty component(s) can be identified. The reasons for selecting the chosen corrective action can be explained.

Criteria 18.43A.1.5

Test equipment adapted and used correctly.

Assessor guide: observe that –

Test equipment is used correctly in accordance with standard operating procedures.

Assessor guide: confirm that –

The test equipment to be used in checking/testing automatic transmissions for correct operation can be identified. The reasons for selected the chosen test equipment can be given. The procedures for testing automatic transmissions, including any necessary adaptation of test equipment, can be given.

Criteria 18.43A.1.6

Component parts correctly assessed for re-use or replacement.

Assessor guide: observe that –

Assessor guide: confirm that –

Component parts can be correctly identified for re-use or replacement. The reasons for identifying components to be re-used or replaced can be given.

Element 18.43A.2 Repair/replace faulty components**Criteria 18.43A.2.1**

Component wear and clearances correctly determined using appropriate test equipment and manufacturers recommendations.

Assessor guide: observe that –

The transmission components are tested for conformance to specification in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for checking automatic transmission components for wear and clearance can be given. The tools, techniques and equipment to be used to determine component wear and clearance can be identified. The reasons for selecting the chosen tools, techniques and equipment can be given.

Criteria 18.43A.2.2

Replacement components correctly selected using manufacturers data.

Assessor guide: observe that –

Assessor guide: confirm that –

Replacement components can be identified using manufacturer's data.

Criteria 18.43A.2.3

Components removed and refitted to converter/transmission assembly following prescribed procedures.

Assessor guide: observe that –

Components are removed from and refitted to the automatic transmission assembly in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for removing and refitting automatic transmission components can be given.

Criteria 18.43A.2.4

Adjustments made correctly using appropriate tooling/equipment and manufacturers data.

Assessor guide: observe that –

Automatic transmission components are correctly adjusted using appropriate tools, techniques and equipment.

Assessor guide: confirm that –

The procedures for adjusting automatic transmission components can be given. The tools, techniques and equipment to be used to maintain and repair automatic transmission assemblies can be identified. The reasons for selecting the chosen tools, techniques and equipment can be given. The effects of the adjustments on automatic transmission operation can be explained.

Criteria 18.43A.2.5

Test and repair activities are accurately recorded.

Assessor guide: observe that –

Test and repair activities are accurately recorded in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for recording test and repair activities can be given.

Criteria 18.43A.2.6

Converter/transmission assembly free of excessive noise and operates to specification after repair work is carried out.

Assessor guide: observe that –

The automatic transmission assembly is free of excessive noise and operates in conformance to specifications.

Assessor guide: confirm that –

The automatic transmission assembly specifications can be identified.

Range statement

This unit covers diagnostic and repair activities associated with automatic, semi automatic and hydrostatic transmissions, and fluid coupling/torque converter assemblies. Control of lockup/shifting etc. can be either fully hydraulic or electronic. Testing and assessment of performance would typically require operation of the plant or equipment.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the diagnosis and repair of automatic transmissions or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 18.44A B Diagnose and repair drive line and final drives

Band – Specialisation band A

Field – Maintenance & diagnostics

Unit Weight 4

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices
18.2A Use power tools/hand held operations

9.1A Draw and interpret sketch
18.55A Dismantle, replace and assemble engineering components

18.1A Use hand tools

Pre-requisite units - Path 2

2.5C11 Measure with graduated devices
18.2A Use power tools/hand held operations

9.2A Interpret technical drawing
18.55A Dismantle, replace and assemble engineering components

18.1A Use hand tools

Element 18.44A.1 Assess drive line and final drive operation

Criteria 18.44A.1.1

Universal and constant velocity joints, conventional/limited slip and locking, differential action and conventional/swing axle operating principles understood.

Assessor guide: observe that –

Assessor guide: confirm that –

The principles of operation of drive lines and final drives can be given. The functions of universal and constant velocity joints, differentials and axles can be given.

Criteria 18.44A.1.2

Relevant information obtained and correctly interpreted prior to any testing.

Assessor guide: observe that –

All relevant specifications, parts lists, manuals and procedures are obtained in accordance with work place procedures.

Assessor guide: confirm that –

Criteria 18.44A.1.3

Preliminary checks undertaken safely and to prescribed procedures.

Assessor guide: observe that –

The drive line and final drive are checked for correct operation.

Assessor guide: confirm that –

The procedures for checking drive lines and final drives for correct operation can be given.

Criteria 18.44A.1.4

Faults are correctly isolated to component level and appropriate corrective action determined.

Assessor guide: observe that –

Assessor guide: confirm that –

Faulty drive line and final drive components can be correctly identified. The appropriate action to correct the faulty component(s) can be identified. The reasons for selecting the chosen corrective action can be explained.

Criteria 18.44A.1.5

Test equipment adapted and used correctly.

Assessor guide: observe that –

Test equipment is used correctly in accordance with standard operating procedures.

Assessor guide: confirm that –

The test equipment to be used in checking/testing drive lines and final drives for correct operation can be identified. The reasons for selecting the chosen test equipment can be given. The procedures for testing drive lines and final drives, including any necessary adaptation of test equipment, can be given.

Criteria 18.44A.1.6

Component parts correctly assessed for reuse or replacement.

Assessor guide: observe that –

Assessor guide: confirm that –

Component parts can be correctly identified for re-use or replacement. The reasons for identifying components to be re-used or replaced can be given.

Element 18.44A.2 Repair/replace faulty components**Criteria 18.44A.2.1**

Component wear and clearances correctly determined using appropriate test equipment and manufacturers recommendations.

Assessor guide: observe that –

The drive line and final drive components are tested for conformance to specification in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for checking drive line and final drive components for wear and clearance can be given. The tools, techniques and equipment to be used to determine component wear and clearance can be identified. The reasons for selecting the chosen tools, techniques and equipment can be given.

Criteria 18.44A.2.2

Replacement components correctly selected using manufacturers data.

Assessor guide: observe that –

Assessor guide: confirm that –

Replacement components can be identified using manufacturer's data.

Criteria 18.44A.2.3

Components removed and refitted to driveline and final drive assemblies following prescribed procedures.

Assessor guide: observe that –

Components are removed from and refitted to drive line and final drive assemblies in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for removing and refitting drive line and final drive components can be given.

Criteria 18.44A.2.4

Adjustments made correctly using appropriate tooling/equipment and manufacturers data.

Assessor guide: observe that –

Drive line and final drive components are correctly adjusted using appropriate tools, techniques and equipment.

Assessor guide: confirm that –

The procedures for adjusting drive line and final drive components can be given. The tools, techniques and equipment to be used to maintain and repair drive line and final drive assemblies can be identified. The reasons for selecting the chosen tools, techniques and equipment can be given. The effects of the adjustments on drive line and final drive operation can be explained.

Criteria 18.44A.2.5

Test and repair activities are accurately recorded.

Assessor guide: observe that –

Test and repair activities are accurately recorded in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for recording test and repair activities can be given.

Criteria 18.44A.2.6

Drive line and final drive assemblies free of excessive noise and operates to specification after repair work is carried out.

Assessor guide: observe that –

The drive line and final drive assembly is free of excessive noise and operates in conformance to specifications.

Assessor guide: confirm that –

The drive line and final drive assembly specifications can be identified.

Range statement

This unit covers diagnosis and repair activities associated with wheeled and/or tracked plant/vehicles, drive line and final drive assemblies used in conventional and all wheel drive equipment. Testing and assessment of performance would typically require operation of plant and equipment.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the diagnosis and repair of drive lines and final drives or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 18.45A A Fault find/repair electrical equipment/components up to 250v single phase supply

Band – Specialisation band A

Field – Maintenance & diagnostics

Unit Weight 4

This unit covers the competencies required to locate and rectify faults in equipment and components using up to 240v single phase power, where they are disconnected

from their electrical supply. This would typically cover plug-in appliances. When work involves disconnection and reconnection of fixed-wired equipment, Unit 18.49A

(Disconnect/reconnect fixed wired equipment (which use up to 1000vAC/1500vDC)) must also be selected.

Pre-requisite units - Path 1

12.2A Electrical/electronic measurement

18.1A Use hand tools

18.2A Use power tools/hand held operations

Element 18.45A.1 Locate fault

Criteria 18.45A.1.1

Equipment/component function determined and understood by reference to circuit diagrams, schematics, manual and/or consultation with technical adviser

Assessor guide: observe that –

All relevant circuit diagrams, specifications, schematics are obtained in accordance with work place procedures Where appropriate, technical advisers are consulted in accordance with work place procedures

Assessor guide: confirm that –

The function of the electrical equipment/component within the circuit can be identified The hazards associated with the electrical equipment/component can be identified The relevant regulatory requirements can be identified

Criteria 18.45A.1.2

Where required equipment is correctly isolated from power supply

Assessor guide: observe that –

Where appropriate, the electrical equipment/component is isolated from the power supply in accordance with standard operating procedures Where appropriate, the isolated electrical equipment/component is tagged in accordance with standard operating procedures Where appropriate, the electrical equipment/component is checked for isolation from the power supply in accordance with standard operating procedures

Assessor guide: confirm that –

The electrical equipment/component isolation procedures can be identified The test equipment to be used to verify isolation of the electrical equipment/circuit can be identified

Criteria 18.45A.1.3

Where appropriate built-in fault indicators, error codes examined and correctly interpreted and results recorded to standard operating procedures

Assessor guide: observe that –

Where appropriate, built-in fault indicators located and read/recorded in accordance with standard operating procedures Where appropriate, error code interpretation documents are obtained in accordance with standard operating procedures

Assessor guide: confirm that –

The errors indicated by built-in devices can be correctly identified

Criteria 18.45A.1.4

Equipment/component is checked and tested using correct and appropriate techniques, procedures, tools and test equipment

Assessor guide: observe that –

The electrical equipment/component is checked and tested for correct operation using appropriate tools, test equipment, techniques and procedures

Assessor guide: confirm that –

The procedures for testing electrical equipment/components for correct operation can be identified The tools, equipment and techniques to be used to test the operation of the electrical equipment/component can be identified The reasons for selecting the chosen tools, equipment and techniques can be explained

Criteria 18.45A.1.5

Check and test results are correctly interpreted and where required verified

Assessor guide: observe that –

Variations from specifications indicated by initial test results are verified using appropriate tools, test equipment, techniques and procedures

Assessor guide: confirm that –

The specifications of the electrical equipment/component can be identified Variations between test results and specifications can be identified

Criteria 18.45A.1.6

Equipment/component fault is identified and localised

Assessor guide: observe that –

Faults in electrical equipment/ components are identified and localised using appropriate tools, test equipment, techniques and procedures

Assessor guide: confirm that –

The procedures for localising faults in electrical equipment/components can be given

Criteria 18.45A.1.7

Equipment/component fault/s are correctly recorded to standard operating procedure

Assessor guide: observe that –

The faults in the electrical equipment/components are recorded/reported in accordance with standard operating procedures

Assessor guide: confirm that –

The procedures for recording/reporting faults in electrical equipment/components can be identified

Element 18.45A.2 Rectify faults**Criteria 18.45A.2.1**

Using correct and appropriate techniques, procedures, tools and equipment, equipment/component/s repaired, replaced or adjusted to specification or manufacturers requirements.

Assessor guide: observe that –

Where appropriate, the electrical equipment/components are repaired, replaced or adjusted to specification in accordance with standard operating procedures Supplier catalogues are obtained in accordance with work place procedures

Assessor guide: confirm that –

The appropriate techniques/procedures for returning the electrical equipment/components to specification can be identified The specifications of the electrical equipment/components can be identified The adjustments that can be made to electrical equipment/components can be identified Replacement components can be selected from supplier catalogues

Criteria 18.45A.2.2

Equipment/component checked and tested using correct and appropriate techniques, procedures, tools and equipment for compliance with site or manufacturers specifications

Assessor guide: observe that –

The appropriate test instruments are used to confirm that the electrical equipment/components have been returned to specification

Assessor guide: confirm that –

The procedures for confirming the electrical equipment/components have been returned to specification can be identified

Criteria 18.45A.2.3

Where appropriate, rectifications report recorded to standard operating procedures

Assessor guide: observe that –

Where appropriate, the rectification of the electrical equipment/ components is recorded in accordance with standard operating procedures

Assessor guide: confirm that –

The procedures for recording electrical equipment/component rectifications can be identified

Range statement

This unit covers the competencies required to locate and rectify faults in equipment and components using up to 240v single phase power, where they are disconnected from their electrical supply. This would also typically cover plug-in appliances. This unit should not be selected if Unit 18.46A (Fault find/repair electrical equipment/components which use up to 1000vAC/1500vDC) has been selected. When work involves disconnection and reconnection of fixed-wired equipment, Unit 18.49A (Disconnect/reconnect fixed wired equipment (which use up to 1000vAC/1500vDC)) must also be selected. Work is undertaken autonomously or in a team environment using predetermined standards of quality, safety and work procedures. Work performed in situ. The following definitions are included to clarify the constituent parts of the competency, but do not by themselves define the competency. Circuits and systems cover industrial control systems for supply, switching, lighting, motor control, etc. using AC and DC power supplies incorporating a range of components, e.g.: switches, fuses, circuit breakers, relays, transformers, thyristors, regulators, motors, etc. All specifications and procedures gained from schematics, circuit diagrams/drawings, engineering data sheets and manufacturers' hand books. Fault finding techniques may include testing for voltage, current, frequency, polarity, phase, circuit continuity, insulation resistance, earth continuity etc. This unit also covers basic mechanical disconnection, dismantling and re-assembly of equipment components, enclosures, drives etc. Correct and appropriate tools and equipment may include continuity testers, ammeters, voltmeters, multimeters, tong testers, wattmeters, cathode ray oscilloscopes, etc. a range of hand and hand held power tools such as pliers, screwdrivers, spanners, etc. All work and work practices undertaken to relevant statutory authorities where required. This may include include controls or switching via contactors, relays, programmable controllers or other electronic switching devices. This unit covers electrical rescue, including electrical shock victim rescue methods and procedures, basic first aid for shock, burns and bleeding, expired air resuscitation, external cardiac compression, and cardio-pulmonary resuscitation.

Evidence**Assessment context**

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the fault finding and repair of AC and DC electrical equipment/components or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Special notes

During assessment the individual will - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 18.46A A Fault find/repair electrical equipment/components up to 1000vAC/1500vDC

Band – Specialisation band A

Field – Maintenance & diagnostics

Unit Weight 6

This unit covers the competencies required to locate and rectify faults in equipment and components using up to 1000vAC/1500vDC single and multi-phase power where

they are disconnected from their electrical supply. When work involves disconnection and reconnection of fixed-wired equipment, Unit 18.49A (Disconnect/reconnect fixed wired equipment (which use up to 1000vAC/1500vDC)) must also be selected.

Pre-requisite units - Path 1

12.2A Electrical/electronic measurement

18.1A Use hand tools

18.2A Use power tools/hand held operations

Element 18.46A.1 Locate fault

Criteria 18.46A.1.1

Equipment/component function determined and understood by reference to circuit diagrams, schematics, manual and/or consultation with technical adviser

Assessor guide: observe that –

All relevant circuit diagrams, specifications, schematics are obtained in accordance with work place procedures Where appropriate, technical advisers are consulted in accordance with work place procedures

Assessor guide: confirm that –

The function of the electrical equipment/component within the circuit can be identified The hazards associated with the electrical equipment/component can be identified The relevant regulatory requirements can be identified

Criteria 18.46A.1.2

Where required, equipment is correctly isolated from power supply

Assessor guide: observe that –

Where appropriate, the electrical equipment/component is isolated from the power supply in accordance with standard operating procedures Where appropriate, the isolated electrical equipment/component is tagged in accordance with standard operating procedures Where appropriate, the electrical equipment/component is checked for isolation from the power supply in accordance with standard operating procedures

Assessor guide: confirm that –

The electrical equipment/component isolation procedures can be identified The test equipment to be used to verify isolation of the electrical equipment/circuit can be identified

Criteria 18.46A.1.3

Where appropriate, built-in fault indicators, error codes, examined and correctly interpreted and results recorded to standard operating procedures

Assessor guide: observe that –

Where appropriate, built-in fault indicators located and read/recorded in accordance with standard operating procedures Where appropriate, error code interpretation documents are obtained in accordance with standard operating procedures

Assessor guide: confirm that –

The errors indicated by built-in devices can be correctly identified

Criteria 18.46A.1.4

Equipment/component is checked and tested using correct and appropriate techniques, procedures, tools and test equipment

Assessor guide: observe that –

The electrical equipment/component is checked and tested for correct operation using appropriate tools, test equipment, techniques and procedures

Assessor guide: confirm that –

The procedures for testing electrical equipment/components for correct operation can be identified The tools, equipment and techniques to be used to test the operation of the electrical equipment/component can be identified The reasons for selecting the chosen tools, equipment and techniques can be explained

Criteria 18.46A.1.5

Check and test results are correctly interpreted and where required verified

Assessor guide: observe that –

Variations from specifications indicated by initial test results are verified using appropriate tools, test equipment, techniques and procedures

Assessor guide: confirm that –

The specifications of the electrical equipment/component can be identified Variations between test results and specifications can be identified

Criteria 18.46A.1.6

Equipment/component fault in identified and localised

Assessor guide: observe that –

Faults in electrical equipment/ components are identified and localised using appropriate tools, test equipment, techniques and procedures

Assessor guide: confirm that –

The procedures for localising faults in electrical equipment/components can be given

Criteria 18.46A.1.7

Equipment/component fault/s are correctly recorded to standard operating procedure

Assessor guide: observe that –

The faults in the electrical equipment/components are recorded/reported in accordance with standard operating procedures

Assessor guide: confirm that –

The procedures for recording/reporting faults in electrical equipment/components can be identified

Element 18.46A.2 Rectify fault/s**Criteria 18.46A.2.1**

Using correct and appropriate techniques, procedures, tools and equipment, equipment/component/s are repaired, replaced or adjusted to specifications or manufacturer's requirements

Assessor guide: observe that –

Where appropriate, the electrical equipment/components are repaired, replaced or adjusted to specification in accordance with standard operating procedures Supplier catalogues are obtained in accordance with workplace procedures

Assessor guide: confirm that –

The appropriate techniques/ procedures for returning the electrical equipment/components to specification can be identified The specifications of the electrical equipment/components can be identified The adjustments that can be made to electrical equipment/components can be identified Replacement components can be selected from supplier catalogues

Criteria 18.46A.2.2

Equipment/component is checked and tested using correct and appropriate techniques, procedures tools and equipment for compliance with site or manufacturer's specifications

Assessor guide: observe that –

The appropriate test instruments are used to confirm that the electrical equipment/components have been returned to specification

Assessor guide: confirm that –

The procedures for confirming the electrical equipment/components have been returned to specification can be identified

Criteria 18.46A.2.3

Where appropriate, rectifications report recorded to standard operating procedures

Assessor guide: observe that –

Where appropriate, the rectification of the electrical equipment/ components is recorded in accordance with standard operating procedures

Assessor guide: confirm that –

The procedures for recording electrical equipment/component rectifications can be identified

Range statement

This unit covers locating and rectifying faults in equipment and components using up to 1000vAC/1500vDC single and multi-phase power, where they are disconnected from their electrical supply. Where work involves up to 240v single phase supply only, Unit 18.45A (Fault find/repair electrical equipment/components which use up to 240v single phase supply should be selected). When work involves disconnection and reconnection of fixed-wired equipment, Unit 18.49A (Disconnect/reconnect fixed wired equipment (which use up to 1000vAC/1500vDC)) must also be selected. Work is undertaken autonomously or in a team environment using predetermined standards of quality, safety and work procedures. Work performed in situ. The following definitions are included to clarify the constituent parts of the competency, but do not by themselves define the competency. Circuits and systems cover industrial control systems for supply, switching, lighting, motor control, etc. using AC and DC power supplies incorporating a range of components, e.g. switches, fuses, circuit breakers, relays, transformers, thyristors, regulators, motors, etc. All specifications and procedures gained from schematics, circuit diagrams/drawings, engineering data sheets and manufacturers' hand books. Fault finding techniques may include testing for voltage, current, frequency, polarity, phase, circuit continuity, insulation resistance, earth continuity etc. This unit covers basic mechanical disconnection, dismantling and re-assembly of equipment components, enclosures, drives etc. Correct and appropriate tools and equipment may include continuity testers, ammeters, voltmeters, multimeters, tong testers, wattmeters, cathode ray oscilloscopes, etc. a range of hand and hand held power tools such as pliers, screwdrivers, spanners, etc. All work and work practices undertaken to relevant statutory authorities where required. This may include controls or switching via contactors, relays, programmable controllers or other electronic switching devices. This unit covers electrical rescue, including electrical shock victim rescue methods and procedures, basic first aid for shock, burns and bleeding, expired air resuscitation, external cardiac compression, and cardio-pulmonary resuscitation.

Evidence**Assessment context**

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the fault finding and repair of AC and DC electrical equipment/components or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 18.47A A Diagnose and maintain electronic controlling systems on mobile plant

Band – Specialisation band A

Field – Maintenance & diagnostics

Unit Weight 4

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices
18.2A Use power tools/hand held operations

9.1A Draw and interpret sketch
18.30A Diagnose and repair low voltage electrical systems

18.1A Use hand tools
18.55A Dismantle, replace and assemble engineering components

Pre-requisite units - Path 2

2.5C11 Measure with graduated devices
18.2A Use power tools/hand held operations

9.2A Interpret technical drawing
18.30A Diagnose and repair low voltage electrical systems

18.1A Use hand tools
18.55A Dismantle, replace and assemble engineering components

Element 18.47A.1 Access and interpret fault codes.

Criteria 18.47A.1.1

Applicable control unit located and identified.

Assessor guide: observe that –
Correct techniques and procedures are followed to locate & identify the control unit.

Assessor guide: confirm that –
Control unit located and correctly identified using Applicable manual.

Criteria 18.47A.1.2

Fault codes accessed using vehicle indicators, meters and diagnostic tooling.

Assessor guide: observe that –
Fault codes accessed correctly with indicators, meters or diagnostic tooling using applicable manuals and procedures.

Assessor guide: confirm that –
Applicable fault codes can be described.

Criteria 18.47A.1.3

Fault codes interpreted.

Assessor guide: observe that –
Fault codes interpreted correctly from applicable manuals.

Assessor guide: confirm that –
The meaning of applicable fault codes is understood and explained.

Criteria 18.47A.1.4

Fault codes cleared from memory according to procedures.

Assessor guide: observe that –
Correct procedure used to clear fault codes from memory and verifies using applicable procedures and manuals.

Assessor guide: confirm that –
Procedure to clear fault codes and verify clearance is outlined.

Criteria 18.47A.1.5

Diagnostic and maintenance procedures performed using applicable techniques and precautions to safeguard electronic components and systems.

Assessor guide: observe that –

Correct techniques used to safeguard electronic components and systems when diagnosing and maintaining typical automotive electronic circuits.

Assessor guide: confirm that –

Correctly identifies sources of potential damage to typical automotive electronic systems when performing maintenance and diagnostic work. Uses techniques and procedures to safeguard against this damage.

Element 18.47A.2 Locate and repair faults using fault codes and manufactures fault finding and repair procedures**Criteria 18.47A.2.1**

Fault traced from fault codes using applicable trouble-shooting procedures.

Assessor guide: observe that –

Logical procedure followed to trace faults identified from fault codes.

Assessor guide: confirm that –

Correct trouble-shooting procedures identified and understood.

Criteria 18.47A.2.2

Faults repaired to required specification.

Assessor guide: observe that –

Appropriate techniques/procedures used to repair faults to manufactures specifications.

Assessor guide: confirm that –

Techniques/procedures used to repair various faults can be outlined.

Element 18.47A.3 Locate and test input components**Criteria 18.47A.3.1**

Input components located and identified.

Assessor guide: observe that –

Locates and identifies various types of input components.

Assessor guide: confirm that –

Locates and identifies various types of input components. Understands and correctly describes the operation and principles of transducers used in control systems.

Criteria 18.47A.3.2

Input components electrically tested.

Assessor guide: observe that –

Applicable procedures followed.

Assessor guide: confirm that –

Testing procedure is outlined.

Element 18.47A.4 Locate and test output components**Criteria 18.47A.4.1**

Output components located and identified.

Assessor guide: observe that –

Locates and identifies various types of output components.

Assessor guide: confirm that –

Identifies and describes component types, functions and locations. Understands and correctly describes the operation and principles of actuators used in control systems.

Criteria 18.47A.4.2

Output components electrically tested..

Assessor guide: observe that –

Output components correctly tested according to manufactures procedures.

Assessor guide: confirm that –

Testing procedure is outlined.

Element 18.47A.5 Remove/ replace and adjust sensors and actuators.**Criteria 18.47A.5.1**

Component part removed correctly.

Assessor guide: observe that –

Correct removal of identified component part.

Assessor guide: confirm that –

Component part removed using appropriate tooling and procedure to applicable instructions.

Criteria 18.47A.5.2

Correct replacement part identified.

Assessor guide: observe that –

Component part identified correctly from manufactures coding and parts listings.

Assessor guide: confirm that –

Correct component part identified and selected from manufacturer listings and codes.

Criteria 18.47A.5.3

Component part replaced correctly.

Assessor guide: observe that –

Correct replacement of component part.

Assessor guide: confirm that –

Component part replaced using appropriate tooling and procedure to manufacturer instructions.

Criteria 18.47A.5.4

Adjustments made in relation to mechanical clearances and measured electrical and resistance values.

Assessor guide: observe that –

Adjustments carried out in relation to mechanical clearances and measured electrical and resistance values.

Assessor guide: confirm that –

Correct adjustments made in relation to mechanical clearances and measured electrical and resistance values to manufacturer specifications and procedures.

Element 18.47A.6 Change operating parameters**Criteria 18.47A.6.1**

Appropriate specifications sourced from plant/equipment identification and applicable manuals and specifications.

Assessor guide: observe that –

Correctly locates and understands appropriate specifications.

Assessor guide: confirm that –

Use of plant/equipment identification and applicable manuals and specifications to source specifications is explained.

Criteria 18.47A.6.1

Appropriate tooling (software/hardware) selected.

Assessor guide: observe that –

Correct tooling (software/hardware) selected according to manufactures manual.

Assessor guide: confirm that –

Understands and describes the concepts of EPROM processors.

Criteria 18.47A.6.2

Plant/equipment identification used to obtain security codes.

Assessor guide: observe that –

Security codes obtained using correct protocol from manufacturer, using plant/equipment identification and appropriate identification.

Assessor guide: confirm that –

Procedure to obtain security codes explained.

Criteria 18.47A.6.2

Download data.

Assessor guide: observe that –

Correctly download data as per manufacturer procedures.

Assessor guide: confirm that –

Procedure to download data is understood and outlined.

Criteria 18.47A.6.3

Data entered for new specifications.

Assessor guide: observe that –

Correctly enters data for new specifications using applicable procedures.

Assessor guide: confirm that –

Procedure for entering data explained.

Criteria 18.47A.6.4

Successful data entry verified.

Assessor guide: observe that –

Verifies successful data entry according to applicable procedures.

Assessor guide: confirm that –

Procedure to verify data entry outlined/explained.

Range statement

This unit covers the skills and knowledge required to diagnose, fault find and remove/replace electronic control systems associated with mobile plant and equipment, including discrete logic, analogue and microprocessor monitoring and control systems.

Maintenance would typically cover wiring harness faults, testing and identifying faulty sensors, actuators and control components, replacement and adjustments to input and output components, accessing data from electronic control unit and applicable manufacturer software/hardware to change operating parameters. Information is sourced from manufactures/technical manuals. All work undertaken to manufacturer's specifications and standard operating procedures. This competency does not cover the skills needed to repair electronic circuitry associated with these systems. If this skill is required Units 18.56A (Diagnose and repair analog equipment and components) and 18.57A (Maintain/service analog/digital electronic equipment) should be selected as appropriate.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with electronic control systems or other competencies requiring the exercise of the skills and knowledge covered by this unit.

To undertake the elements of this competency an understanding of the concepts of electronic circuitry components their functions and operation at a basic level is required. Typically this would include resistors, capacitors, diodes, transistors, ICs, EPROMs ,ect.

To ensure safeguarding when diagnosing and maintaining these systems it is recommended the importance of the above concepts are understood in relation to voltage and current in typical automotive type electronic applications. The aim of the unit is to develop skills in the troubleshooting and repairs to electronic systems using recommended procedures and underpinning knowledge of electronic components and systems.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 18.48A A Fault find and repair/rectify basic electrical circuits

Band – Specialisation band A

Field – Maintenance & diagnostics

Unit Weight 10

Pre-requisite units - Path 1

9.1A Draw and interpret sketch

10.3A Install and test electrical wiring and circuits (up to 1000vAC/1500vDC)

18.2A Use power tools/hand held operations

9.2A Interpret technical drawing

12.2A Electrical/electronic measurement

18.49A Disconnect/reconnect fixed wired equipment which use up to 1000vAC/1500vDC

10.2A Terminate and connect electrical wiring

18.1A Use hand tools

Element 18.48A.1 Locate fault

Criteria 18.48A.1.1

Circuit function and characteristics determined and understood by reference to circuit diagrams, specifications, schematics and/or consultation with technical adviser.

Assessor guide: observe that –

All relevant circuit diagrams, specifications, schematics are obtained in accordance with work site procedures. Where appropriate, technical advisers are consulted in accordance with work site procedures.

Assessor guide: confirm that –

The circuit characteristics can be identified. The hazards associated with the electrical circuit(s) can be identified. The relevant regulatory requirements can be identified.

Criteria 18.48A.1.2

Where appropriate, built-in fault indicators, error codes examined and correctly interpreted and results recorded to standard operational procedures.

Assessor guide: observe that –

Where appropriate, built-in fault indicators located and read/recorded in accordance with work site procedures. Where appropriate, error code interpretation documents obtained in accordance with work site procedures.

Assessor guide: confirm that –

Errors indicated by built-in devices can be correctly identified.

Criteria 18.48A.1.3

Where appropriate, circuit is correctly isolated from power supply.

Assessor guide: observe that –

Where appropriate, the electrical circuit is isolated from the power supply in accordance with work site procedures. Where appropriate, the isolated circuit is tagged in accordance with work site procedures. Where appropriate, circuit isolation is verified in accordance with work site procedures.

Assessor guide: confirm that –

Circuit isolation procedures can be identified.

Criteria 18.48A.1.4

Faults are verified or localised using correct and appropriate techniques, procedures, tools and test equipment.

Assessor guide: observe that –

Circuit faults are confirmed/localised using appropriate test equipment, work techniques and tools in accordance with work site procedures.

Assessor guide: confirm that –

Common electrical test instruments and their application can be identified. Common techniques for testing electrical circuits can be identified.

Criteria 18.48A.1.5

Faults are recorded to standard operating procedures.

Assessor guide: observe that –

Faults in the electrical circuit are recorded/reported in accordance with work site procedures.

Assessor guide: confirm that –

The recording/reporting requirements for electrical circuit faults can be identified.

Element 18.48A.2 Repair/rectify fault(s)**Criteria 18.48A.2.1**

Using correct and appropriate techniques, procedures, tools and equipment, circuit/s is repaired, replaced or adjusted to specifications or manufacturer's requirements.

Assessor guide: observe that –

Where appropriate, the electric circuits are repaired/adjusted to specification in accordance with work site procedures.

Assessor guide: confirm that –

The appropriate techniques/procedures for returning the circuit/s to specification can be identified.

Criteria 18.48A.2.2

Circuit/s is checked and tested using correct and appropriate techniques, procedures, tools and equipment for compliance with site or manufacturer's specifications.

Assessor guide: observe that –

The appropriate test instruments are used to confirm that the circuit/s has been returned to specification.

Assessor guide: confirm that –

The site/manufacturer's circuit specifications can be identified.

Criteria 18.48A.2.3

Where appropriate, repair/rectification report recorded to standard operating procedures.

Assessor guide: observe that –

Any rectification of the circuit(s) is recorded in accordance with work site procedures.

Assessor guide: confirm that –

The requirements for recording circuit rectifications can be identified.

Range statement

Work undertaken autonomously or in a team environment using predetermined standards of quality, safety and work procedures. Work performed in situ. The following definitions are included to clarify the constituent parts of the competency, but do not by themselves define the competency. Circuits and systems cover industrial control systems for supply, switching, lighting, motor control, etc. using AC and DC power supplies incorporating a range of components, e.g.: switches, fuses, circuit breakers, relays, transformers, thyristors, regulators, motors, etc. All specifications and procedures gained from schematics, circuit diagrams/drawings, engineering data sheets and manufacturers' hand books. Fault finding techniques may include testing for voltage, current, frequency, polarity, phase, circuit continuity, insulation resistance, earth continuity etc. Correct and appropriate tools and equipment may include continuity testers, ammeters, voltmeters, multimeters, tong testers, wattmeters, cathode ray oscilloscopes, etc. a range of hand and hand held power tools such as pliers, screwdrivers, spanners, etc. All work and work practices undertaken to relevant statutory authorities where required. This may include controls or switching via contractors, relays, programmable controllers or other electronic switching devices. This unit covers electrical rescue, including electrical shock victim rescue methods and procedures, basic first aid for shock, burns and bleeding, expired air resuscitation, external cardiac compression, and cardio-pulmonary resuscitation. Basic Circuits - A basic circuit is defined as a single circuit with a single output. A single circuit may be controlled by one or more devices and the output may control one or more devices.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant data sheets, catalogues, circuit diagrams and engineering drawings. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the fault finding of basic electrical circuits, or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Special notes

During assessment, the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities.

Unit MEM 18.49A A Disconnect/reconnect fixed wired equipment up to 1000vAC/1500vDC

Band – Specialisation band A

Field – Maintenance & diagnostics

Unit Weight 3

This unit covers the competencies required to connect and disconnect equipment. Work is performed in situ and it may include the original connection of fixed wire equipment. Disconnection of equipment may include electric motors, modular sensing devices, limit switches, etc.

Note - This unit has dual status and is to be regarded as both a Specialisation band A unit and Specialisation band B unit for progression to C7 (AQF level IV)

Pre-requisite units - Path 1

9.2A Interpret technical drawing
18.1A Use hand tools

10.2A Terminate and connect electrical wiring

12.2A Electrical/electronic measurement

Element 18.49A.1 Disconnect equipment

Criteria 18.49A.1.1

Electrical characteristics of equipment and circuit determined by reference to circuit drawings, schematics, reference manuals, equipment specifications, identification plate and/or consultation with technical adviser

Assessor guide: observe that –

All relevant circuit diagrams, specifications, schematics, etc. are obtained in accordance with work site procedures
Where appropriate, technical advisers are consulted in accordance with work site procedures

Assessor guide: confirm that –

The characteristics of the circuit and the equipment can be identified The hazards associated with the circuits and the equipment can be identified The relevant regulatory requirements can be identified

Criteria 18.49A.1.2

Where appropriate, equipment characteristics determined and recorded to standard operating procedures (rotation etc.)

Assessor guide: observe that –

Where appropriate, the equipment characteristics are determined and recorded in accordance with standard operating procedures

Assessor guide: confirm that –

The procedures for determining equipment characteristics can be given The procedures for recording equipment characteristics can be given The tools, techniques and equipment required to determine equipment characteristics can be identified

Criteria 18.49A.1.3

Point/s of isolation identified using correct and appropriate procedure

Assessor guide: observe that –

The procedures to be followed in identifying the point(s) of isolation of fixed wired equipment were followed

Assessor guide: confirm that –

The point(s) of isolation for the fixed wired equipment can be identified The reasons for selecting the chosen isolation point(s) can be explained

Criteria 18.49A.1.4

Equipment is isolated using correct and appropriate techniques and procedures

Assessor guide: observe that –

The fixed wired equipment is correctly isolated using appropriate techniques in accordance with standard operating procedures

Assessor guide: confirm that –

The isolation procedures for the fixed wired equipment can be given The technique to be used to isolate the fixed wired equipment can be identified The reasons for selecting the chosen technique can be given

<p>Criteria 18.49A.1.5 All lock off equipment and signage requirements used correctly and appropriately</p>	<p><i>Assessor guide: observe that –</i> All lock off equipment and signs are used correctly and appropriately</p>	<p><i>Assessor guide: confirm that –</i> The lock off equipment and signs to be used can be identified The reasons for using lock off equipment and signs can be given</p>
<p>Criteria 18.49A.1.6 Electrical isolation is proven using correct and appropriate techniques, procedures and test equipment</p>	<p><i>Assessor guide: observe that –</i> Electrical isolation is proven using appropriate techniques and equipment in accordance with standard operating procedures</p>	<p><i>Assessor guide: confirm that –</i> The procedures for proving electrical isolation can be given The tools, techniques and equipment to be used to prove electrical isolation can be identified</p>
<p>Criteria 18.49A.1.7 Conductor layout is noted, recorded and labelled to standard operating procedure</p>	<p><i>Assessor guide: observe that –</i> Conductors are labelled and their layout recorded in accordance with standard operating procedures</p>	<p><i>Assessor guide: confirm that –</i> The procedures for labelling conductors and recording conductor layout can be given</p>
<p>Criteria 18.49A.1.8 Conductors disconnected using correct and appropriate techniques, procedures, tools and equipment</p>	<p><i>Assessor guide: observe that –</i> Conductors are disconnected using appropriate tools, techniques and equipment in accordance with standard operating procedures</p>	<p><i>Assessor guide: confirm that –</i> The procedures for disconnecting conductors can be given The tools, techniques and equipment to be used to disconnect conductors can be identified</p>
<p>Criteria 18.49A.1.9 Disconnected cables/connections are terminated and made safe to standard operating procedures</p>	<p><i>Assessor guide: observe that –</i> Disconnected cables/connections are terminated in accordance with standard operating procedures</p>	<p><i>Assessor guide: confirm that –</i> The procedures for terminating disconnected cables/connections can be given</p>
<p>Element 18.49A.2 Connect equipment</p>		
<p>Criteria 18.49A.2.1 Characteristics of the equipment to be connected are identified and connection requirements determined</p>	<p><i>Assessor guide: observe that –</i> All relevant circuit diagrams, specifications, schematics, etc. are obtained in accordance with work site procedures Where appropriate, technical advisers are consulted in accordance with work site procedures</p>	<p><i>Assessor guide: confirm that –</i> The characteristics of the circuit and the equipment can be identified The hazards associated with the circuits and the equipment can be identified The relevant regulatory requirements can be identified</p>
<p>Criteria 18.49A.2.2 Circuit checked for safe isolation using correct and appropriate techniques, procedures and test equipment</p>	<p><i>Assessor guide: observe that –</i> The circuit is checked for safe isolation using appropriate tools, techniques and equipment in accordance with standard operating procedures</p>	<p><i>Assessor guide: confirm that –</i> The procedures for checking circuits for safe isolation can be given The tools, techniques and equipment required to check circuits for safe isolation can be identified</p>

Criteria 18.49A.2.3

Connections checked and conductors prepared for termination using correct and appropriate tools and procedures

Assessor guide: observe that –

Connections are checked and conductors prepared for termination using appropriate tools and equipment in accordance with standard operating procedures

Assessor guide: confirm that –

The procedures for terminating conductors and checking connections can be given The tools, techniques and equipment to be used to terminate conductors and check connections can be identified

Criteria 18.49A.2.4

Conductors are connected to equipment to specifications using correct and appropriate techniques, tools and equipment

Assessor guide: observe that –

The conductors are connected to the equipment using appropriate tools, techniques and equipment in conformance with specifications and standard operating procedures

Assessor guide: confirm that –

The specifications for the connections to be made can be identified The procedures for connecting conductors to equipment can be given The tools, techniques and equipment to be used to connect the conductors to the equipment can be identified

Criteria 18.49A.2.5

All cables/wires/conduit fastened/sealed to specifications using correct and appropriate techniques, tools and equipment

Assessor guide: observe that –

All cables/wires/conduits are fastened/sealed to specifications using appropriate tools, techniques and equipment in accordance with standard operating procedures

Assessor guide: confirm that –

The procedures for fastening and sealing cables, wires and conduits can be given The tools, techniques and equipment to be used to fasten and seal the cables, wires and conduits can be identified

Criteria 18.49A.2.6

All lock off equipment and signage removed using standard operating procedures

Assessor guide: observe that –

All lock off equipment and signage is removed from the equipment in accordance with standard operating procedures

Assessor guide: confirm that –

The procedures for removing lock off equipment and signage can be given

Criteria 18.49A.2.7

Equipment and circuit checked and tested for compliance with specifications using correct and appropriate techniques, procedures, tools and equipment

Assessor guide: observe that –

The equipment and circuits are checked and tested using appropriate tools, techniques and equipment for conformance to specifications in accordance with standard operating procedures

Assessor guide: confirm that –

The operational specifications of the fixed wired equipment can be identified The procedures for checking the operation of the equipment and circuits can be given The tools, techniques and equipment to be used to check and test the compliance of the equipment with specifications can be identified

Element 18.49A.3 Perform emergency first aid**Criteria 18.49A.3.1**

Situation assessed to identify points of danger to the injured person and potential rescuer

Assessor guide: observe that –

All potential points of danger are considered when planning rescue or provision of assistance

Assessor guide: confirm that –

Potential dangers are identified

Criteria 18.49A.3.2

Rescue/recovery of injured person, or assistance to injured person undertaken in accordance with recognised standards/procedures Contact made with appropriate medical and rescue authorities

Assessor guide: observe that –

Appropriate procedures are followed for the movement/treatment of injured, including:

- clearing of airways
- CPR (cardio-pulmonary resuscitation)
- care of spinal injuries
- treatment of cuts/lesions etc
- treatment of burns/scalds
- treatment of shock

Assessor guide: confirm that –

Recognised procedures for the movement and treatment of the injured person are identified
Appropriate local medical and rescue services identified

Criteria 18.49A.3.3

Details of first aid given recorded

Assessor guide: observe that –

Details of first aid are accurately recorded

Assessor guide: confirm that –

The details to be recorded of first aid given can be identified The procedures for recording first aid given can be identified The reasons for recording first aid given can be explained

Range statement

Work undertaken autonomously or in a team environment using predetermined standards of quality, safety and work procedures. Work performed in situ and may include the original connection of fixed wire equipment. Disconnection of equipment may include electric motors, modular sensing devices, limit switches. Correct and appropriate tools and equipment may include ammeters, voltmeters, multimeters, tong testers, etc; a range of hand tools such as pliers, screwdrivers, sockets, spanners, conduit benders etc. If power tools are used Unit 18.2A (Use power tools/hand held operations) must also be selected. Isolation refers to the safe disconnection of all electrical power to equipment or equipment supply circuits via switching, circuit breakers or fuses etc. on circuits/equipment using up to 1000 volts AC or 1500 volts DC single or multi-phase supply. All work and work practices undertaken to regulatory and legislative requirements.

Evidence**Assessment context**

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the connection and disconnection of fixed wired equipment up to 1000 volts AC, 1500 volts DC or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. - Standards and procedures for the provision of emergency first aid. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 18.50A A Disconnect/reconnect fixed wired equipment over 1000vAC/1500vDC

Band – Specialisation band A

Field – Maintenance & diagnostics

Unit Weight 3

Notes - This unit has dual status and is to be regarded as both a Specialisation Band A unit and a Specialisation Band B unit for progression to C7 (AQF level IV)

Pre-requisite units - Path 1

9.2A Interpret technical drawing

10.2A Terminate and connect electrical wiring

12.2A Electrical/electronic measurement

18.1A Use hand tools

Element 18.50A.1 Disconnect equipment

Criteria 18.50A.1.1

Electrical characteristics of equipment and circuit are determined by reference to circuit drawings, schematics, reference manuals, equipment specifications, identification plates and/or consultation with technical adviser.

Assessor guide: observe that –

All relevant circuit diagrams, specifications, schematics, etc are obtained in accordance with work site procedures. Where appropriate, technical advisers are consulted in accordance with work site procedures.

Assessor guide: confirm that –

The characteristics of the circuit and the equipment can be identified. The hazards associated with the circuits and equipment can be identified. The relevant regulatory requirements can be identified.

Criteria 18.50A.1.2

Where appropriate, equipment characteristics determined and recorded to standard operating procedures (rotation etc.).

Assessor guide: observe that –

Where appropriate, the equipment characteristics are determined and recorded in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for determining equipment characteristics can be given. The procedures for recording equipment characteristics can be given. The tools, techniques and equipment required to determine equipment characteristics can be identified.

Criteria 18.50A.1.3

Points of isolation identified using correct and appropriate procedure.

Assessor guide: observe that –

The procedures to be followed in identifying the point(s) of isolation of fixed wired equipment were followed.

Assessor guide: confirm that –

The point(s) of isolation for the fixed wired equipment can be identified. The reasons for selecting the chosen isolation point(s) can be explained.

<p>Criteria 18.50A.1.4 Equipment is isolated using correct and appropriate techniques and procedures.</p>	<p><i>Assessor guide: observe that –</i> The fixed wired equipment is correctly isolated using appropriate techniques in accordance with standard operating procedures.</p>	<p><i>Assessor guide: confirm that –</i> The isolation procedures for the fixed wired equipment can be given. The technique to be used to isolate the fixed wired equipment can be identified. The reasons for selecting the chosen technique can be given.</p>
<p>Criteria 18.50A.1.5 All lock off equipment and signage requirements used correctly and appropriately.</p>	<p><i>Assessor guide: observe that –</i> All lock off equipment, signage and barriers are used correctly and appropriately.</p>	<p><i>Assessor guide: confirm that –</i> The lock off equipment and signs to be used can be identified. The reasons for using lock off equipment, signs and barriers can be given.</p>
<p>Criteria 18.50A.1.6 Electrical isolation is proven using correct and appropriate techniques, procedures and test equipment.</p>	<p><i>Assessor guide: observe that –</i> Electrical isolation is proven using appropriate techniques and equipment in accordance with standard operating procedures.</p>	<p><i>Assessor guide: confirm that –</i> The procedures for proving electrical isolation can be given. The tools, techniques and equipment to be used to prove electrical isolation can be identified.</p>
<p>Criteria 18.50A.1.7 Conductor layout is noted, recorded and labelled to standard operating procedures.</p>	<p><i>Assessor guide: observe that –</i> Conductors are labelled and their layout recorded in accordance with standard operating procedures.</p>	<p><i>Assessor guide: confirm that –</i> The procedures for labelling conductors and recording conductor layout can be given.</p>
<p>Criteria 18.50A.1.8 Conductors disconnected using correct and appropriate techniques, procedures, tools and equipment.</p>	<p><i>Assessor guide: observe that –</i> Conductors are disconnected using appropriate tools, techniques and equipment in accordance with standard operating procedures.</p>	<p><i>Assessor guide: confirm that –</i> The procedures for disconnecting conductors can be given. The tools, techniques and equipment to be used to disconnect conductors can be identified.</p>
<p>Criteria 18.50A.1.9 Disconnected cables/connections are made safe to standard operating procedures.</p>	<p><i>Assessor guide: observe that –</i> Disconnected cables/connections are terminated in accordance with standard operating procedures.</p>	<p><i>Assessor guide: confirm that –</i> The procedures for terminating disconnected cables/connections can be given.</p>

Element 18.50A.2 Connect equipment

Criteria 18.50A.2.1

Characteristics of the equipment to be connected are identified and connection requirements determined.

Assessor guide: observe that –

All relevant circuit diagrams, specifications, schematics, etc are obtained in accordance with work site procedures. Where appropriate, technical advisers are consulted in accordance with work site procedures.

Assessor guide: confirm that –

The characteristics of the circuit and the equipment can be identified. The hazards associated with the circuits and equipment can be identified. The relevant regulatory requirements can be identified.

Criteria 18.50A.2.2

Circuit checked for safe isolation using correct and appropriate techniques, procedures and test equipment.

Assessor guide: observe that –

The circuit is checked for safe isolation using appropriate tools, techniques and equipment in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for checking circuits for safe isolation can be given. The tools, techniques and equipment required to check circuits for safe isolation can be identified.

Criteria 18.50A.2.3

Connections are checked and prepared for termination using correct and appropriate tools and procedures.

Assessor guide: observe that –

Connections are checked and conductors prepared for termination using appropriate tools and equipment in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for terminating conductors and checking connections can be given. The tools, techniques and equipment to be used to terminate conductors and check connections can be identified.

Criteria 18.50A.2.4

Conductors are connected to equipment to specifications using correct and appropriate techniques, tools and equipment.

Assessor guide: observe that –

The conductors are connected to the equipment using appropriate tools, techniques and equipment in conformance with specifications, regulatory requirements and standard operating procedures.

Assessor guide: confirm that –

The specifications and regulatory requirements for the connections to be made can be identified. The procedures for connecting conductors to equipment can be given. The tools, techniques and equipment to be used to connect the conductors to the equipment can be identified.

Criteria 18.50A.2.5

All cables/wires/conduit fastened/sealed to specifications, using correct and appropriate techniques, tools and equipment.

Assessor guide: observe that –

All cables/wires/conduits are fastened/sealed to specifications using appropriate tools, techniques and equipment in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for fastening and sealing cables, wires and conduits can be given. The tools, techniques and equipment to be used to fasten and seal the cables, wires and conduits can be identified.

Criteria 18.50A.2.6

All lock off equipment and signage removed using standard operating procedures.

Assessor guide: observe that –

All lock-off equipment, barriers and signage are removed from the equipment in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for removing lock-off equipment, barriers and signage can be given.

Criteria 18.50A.2.7

Equipment and circuit checked and tested for compliance to specifications using correct and appropriate techniques, procedures, tools and equipment.

Assessor guide: observe that –

The equipment and circuits are checked and tested using appropriate tools, techniques and equipment for performance to specifications in accordance with standard operating procedures.

Assessor guide: confirm that –

The operational specifications of the fixed wired equipment can be identified. The procedures for checking the operation of the equipment and circuits can be given. The tools, techniques and equipment to be used to check and test the compliance of the equipment with specifications can be identified.

Element 18.50A.3 Perform emergency first aid**Criteria 18.50A.3.1**

Situation assessed to identify points of danger to the injured person and potential rescuer.

Assessor guide: observe that –

All potential points of danger are considered when planning rescue or provision of assistance.

Assessor guide: confirm that –

Potential dangers are identified.

Criteria 18.50A.3.2

Rescue/recovery of injured person, or assistance to injured person undertaken in accordance with recognised standards/procedures. Contact made with appropriate medical and rescue authorities.

Assessor guide: observe that –

Appropriate procedures are followed for the movement/treatment of injured, including:

- clearing of airways
- CPR (cardio-pulmonary resuscitation)
- care of spinal injuries
- treatment of cuts/lesions etc
- treatment of burns/scalds
- treatment of shock

Assessor guide: confirm that –

Recognised procedures for the movement and treatment of the injured person are identified. Appropriate local medical and rescue services identified.

Criteria 18.50A.3.3

Details of first aid given recorded.

Assessor guide: observe that –

Details of first aid are accurately recorded.

Assessor guide: confirm that –

The details to be recorded of first aid given can be identified. The procedures for recording first aid given can be identified. The reasons for recording first aid given can be explained.

Range statement

Work undertaken autonomously or part of a team environment using predetermined standards of quality, safe work procedures. Work performed in situ. Correct and appropriate tools and equipment may include ammeters, tong testers, continuity testers, voltmeters, multimeters etc., a range of hand held tools such as pliers, screwdrivers, sockets, spanners, keys etc. If power tools are used Unit 18.2A (Use powertools/hand held operations) must also be selected. Isolation refers to the safe disconnection of electrical power to equipment or equipment supply circuit with switch breaker or fuses etc. Circuit applies to voltage levels above 1000 volts AC and 1500 volts DC. All work and work practices undertaken to regulatory and legislative requirements. Persons undertaking this work would be appropriately recognised and endorsed by relevant statutory authorities where required.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. - Standards and procedures for the provision of emergency first aid. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the connection and disconnection of fixed wired equipment over 1000 volts AC or 1500 volts DC or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 18.51A A Fault find repair/rectify complex electrical circuits

Band – Specialisation band A

Field – Maintenance & diagnostics

Unit Weight 6

Notes - This unit has dual status and is to be regarded as both a Specialisation band A unit and Specialisation band B unit for progression to C5 (AQF level V)

Pre-requisite units - Path 1

9.1A Draw and interpret sketch

9.2A Interpret technical drawing

10.2A Terminate and connect electrical wiring

10.3A Install and test electrical wiring and circuits (up to 1000vAC/1500vDC)

12.2A Electrical/electronic measurement

12.4A Precision electrical/electronic measurement

18.1A Use hand tools

18.2A Use power tools/hand held operations

18.2A Use power tools/hand held operations

18.48A Fault find and repair/rectify basic electrical circuits

18.49A Disconnect/reconnect fixed wired equipment which use up to 1000vAC/1500vDC

Element 18.51A.1 Locate fault

Criteria 18.51A.1.1

Circuit/system function and characteristics determined and understood by reference to circuit diagrams, specifications, schematics and/or consultation with technical adviser.

Assessor guide: observe that –

All relevant circuit diagrams, specifications, schematics are obtained in accordance with work site procedures. Where appropriate, technical advisers are consulted in accordance with work site procedures.

Assessor guide: confirm that –

The circuit function and characteristics can be identified. The hazards associated with the electrical circuit(s) can be identified. The relevant regulatory requirements can be identified.

Criteria 18.51A.1.2

Where appropriate, built-in fault indicators, error codes examined and correctly interpreted and results recorded to standard operational procedures.

Assessor guide: observe that –

Where appropriate, built-in fault indicators located and read/recorded in accordance with work site procedures. Where appropriate, error code interpretation documents obtained in accordance with work site procedures.

Assessor guide: confirm that –

Errors indicated by built-in devices can be correctly identified.

Criteria 18.51A.1.3

Where appropriate, circuit(s) correctly isolated from power supply.

Assessor guide: observe that –

Where appropriate, the electrical circuit is isolated from the power supply in accordance with work site procedures. Where appropriate, the isolated circuit is tagged in accordance with work site procedures. Where appropriate, circuit isolation is verified in accordance with work site procedures.

Assessor guide: confirm that –

Circuit isolation procedures can be identified.

Criteria 18.51A.1.4

Faults are verified or localised using correct and appropriate techniques, procedures, tools and test equipment.

Assessor guide: observe that –

Circuit faults are confirmed/localised using appropriate test equipment, techniques and tools in accordance with work site procedures.

Assessor guide: confirm that –

Common electrical test instruments and their application can be identified. Common techniques for testing electrical circuits can be identified.

Criteria 18.51A.1.5

Faults are recorded to standard operating procedures.

Assessor guide: observe that –

Faults in electrical circuits are recorded/reported in accordance with work site procedures.

Assessor guide: confirm that –

The recording/reporting requirements for electrical circuit faults can be identified.

Element 18.51A.2 Repair/rectify fault(s)**Criteria 18.51A.2.1**

Using correct and appropriate techniques, procedures, tools and equipment, circuit/system is repaired, replaced or adjusted to specifications or manufacturer's requirements.

Assessor guide: observe that –

Where appropriate the electric circuit/system is repaired/adjusted to specification in accordance with work site procedures.

Assessor guide: confirm that –

The appropriate techniques/procedures for returning the circuit/system to specification can be identified.

Criteria 18.51A.2.2

Circuit/system is checked and tested using correct and appropriate techniques, procedures, tools and equipment for compliance with site or manufacturer's specifications.

Assessor guide: observe that –

The appropriate test instruments are used to confirm that the circuit(s) has been returned to specification.

Assessor guide: confirm that –

The site/manufacturer's circuit specifications can be identified.

Criteria 18.51A.2.3

Where appropriate, repair/rectification report recorded to standard operating procedures.

Assessor guide: observe that –

Any rectification of the circuit(s) is recorded in accordance with work site procedures.

Assessor guide: confirm that –

The requirements for recording circuit rectification can be identified.

Range statement

Work undertaken autonomously or in a team environment using predetermined standards of quality, safety and work procedures. Work performed in situ. The following definitions are to clarify the constituent parts of the competency, but do not by themselves define the competency. Circuits and systems cover industrial control systems for supply, switching, lighting, motor control, etc. using AC and DC power supplies incorporating a range of components, e.g.: switches, fuses, circuit breakers, relays, transformers, thyristors, regulators, motors, etc. This may include controls or switching via contactors, relays, programmable controllers or other electronic switching devices. Fault finding techniques may include testing for voltage, current, frequency, polarity, phase, circuitry continuity, insulation resistance, earth continuity etc. Correct and appropriate tools and equipment may include continuity testers, ammeters, voltmeters, multimeters, tong testers, wattmeters, cathode ray oscilloscopes, etc. a range of hand and hand held power tools such as pliers, screwdrivers, spanners, etc. All specifications and procedures gained from schematics, circuit diagrams/drawings, engineering data sheets and manufacturers' hand books. All work and work practices undertaken to relevant statutory authorities where required. Complex Circuits - A complex circuit is defined as one made up of more than one interdependent circuit. A complex circuit is made up of more than one circuit, controlling and processing inputs or outputs. This unit covers electrical rescue, including electrical shock victim rescue methods and procedures, basic first aid for shock, burns and bleeding, expired air resuscitation, external cardiac compression, and cardio-pulmonary resuscitation.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant data sheets, catalogues, circuit diagrams and engineering drawings. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the fault finding of interconnected electrical circuits, or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Special notes

During assessment, the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities.

Unit MEM 18.52A A Maintain and repair fluid power systems for mobile plant

Band – Specialisation band A

Field – Maintenance & diagnostics

Unit Weight 4

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices
18.2A Use power tools/hand held operations

9.1A Draw and interpret sketch
18.55A Dismantle, replace and assemble engineering components

18.1A Use hand tools

Pre-requisite units - Path 2

2.5C11 Measure with graduated devices
18.2A Use power tools/hand held operations

9.2A Interpret technical drawing
18.55A Dismantle, replace and assemble engineering components

18.1A Use hand tools

Element 18.52A.1 Secure system from potentially hazardous situations

Criteria 18.52A.1.1

Sources of stored energy are identified.

Assessor guide: observe that –
Sources of stored energy are identified on mobile plant.

Assessor guide: confirm that –
Different sources of stored energy and their applications can be described and identified from circuit diagrams and manufacturer manuals.

Criteria 18.52A.1.2

Mobile plant is assessed for potentially hazardous situations and conditions.

Assessor guide: observe that –
Hazardous situations/conditions are identified and appropriate safety measures applied.

Assessor guide: confirm that –
Hazardous situations/conditions relating to maintenance and repair of fluid power systems can be outlined and safety precautions described.

Criteria 18.52A.1.3

Accumulators and position actuators are bled down to remove stored energy as per manufacturers instructions.

Assessor guide: observe that –
Accumulators bled down and actuators positioned correctly.

Assessor guide: confirm that –
The reasons for bleeding accumulators and actuators can be outlined and the hazards associated with working on pressurised systems explained.

Element 18.52A.2 Check hydraulic system components

Criteria 18.52A.2.1

System components identified correctly, using appropriate circuit diagrams or manufacturers instruction.

Assessor guide: observe that –

Appropriate circuit diagram or manufacturer instructions selected, system components identified and other relevant information interpreted. All applicable components are identified on mobile plant.

Assessor guide: confirm that –

The full range of hydraulic system components can be identified in a mobile plant application. Information on circuit diagram or manufacturer instructions can be explained. The characteristics and operational function of each system component can be described.

Criteria 18.52A.2.2

Faults are traced and localised with reference to manufacturer trouble shooting procedures and flow charts.

Assessor guide: observe that –

Faulty components are traced and localised using fluid power principles, procedures and safety requirements.

Assessor guide: confirm that –

Methods and techniques for tracing and localising faults can be outlined and explained.

Criteria 18.52A.2.3

The operational function of components is inspected and tested in accordance with standard operating procedures.

Assessor guide: observe that –

Equipment for testing hydraulic system components is used correctly. Components including hoses, pipes, actuators, pumps, valves, cylinders and rams are inspected/tested according to procedure and using fluid power principles. All relevant hydraulic circuits, drawings, instructions, manuals and data sheets and specifications are obtained in accordance with standard operating procedures. Hydraulic components not operating in accordance with specifications are identified

Assessor guide: confirm that –

The procedures and equipment for inspecting and testing hydraulic system components can be identified. Problems relating to faulty hydraulic system components/operation can be described. The specifications of each hydraulic system component can be identified. The reasons for hydraulic components not operating in accordance with specifications can be given. All safety procedures and precautions can be identified. Common faults in hydraulic components can be described.

Element 18.52A.3 Replace faulty system components

Criteria 18.52A.3.1

Faulty components are correctly removed from system using appropriate tools, techniques and procedures.

Assessor guide: observe that –

Components are correctly removed from system.

Assessor guide: confirm that –

Removal methods for various components can be described.

Criteria 18.52A.3.2

Replacement components are sourced where appropriate from manufacturer/supplier.

Assessor guide: observe that –

Replacement pipes and hoses identified using catalogues or electronic media. Replacement parts are obtained using appropriate procedures

Assessor guide: confirm that –

Information in catalogues or electronic media can be correctly interpreted. Procedures to obtain replacement parts can be outlined.

Criteria 18.52A.3.3

Hoses, tubes and pipework are prepared and assembled using appropriate tools, techniques and procedures.

Assessor guide: observe that –

Appropriate conductors and fittings are selected from manufacturer catalogues and charts. Conductors are cut to length using appropriate tooling/machine. Conductors are assembled using correct techniques and orientation

Assessor guide: confirm that –

Typical conductor types and fittings can be identified and their applications explained. Methods for cutting and assembling hoses, tubes and pipework can be explained.

Criteria 18.52A.3.4

Replacement components and conductors correctly assembled and refitted to system.

Assessor guide: observe that –

Component parts correctly replaced in system using appropriate tools and techniques.

Assessor guide: confirm that –

Tools and techniques for fitting replacement components and conductors can be outlined.

Criteria 18.52A.3.5

System tested and adjusted for correct operation according to standard operating procedures.

Assessor guide: observe that –

Replacement components are tested and adjusted for correct operation and conformance to specifications in accordance with standard operating procedures. Conductor assemblies are conducted using machine circuits and/or test rigs and correct assembly verified.

Assessor guide: confirm that –

The correct operation of hydraulic components and conductors can be identified. The procedures for checking and adjusting the system can be given.

Element 18.52A.4 Dismantle, inspect and repair linear actuators**Criteria 18.52A.4.1**

Hydraulic cylinders and rams are dismantled using appropriate tools, techniques and procedures.

Assessor guide: observe that –

Linear actuators are dismantled without damage, using correct tools, techniques, procedures and safety measures.

Assessor guide: confirm that –

The tools, techniques and procedures used for dismantling can be identified. Safety measures for dismantling linear actuators can be described.

<p>Criteria 18.52A.4.2 Component parts evaluated for condition.</p>	<p><i>Assessor guide: observe that –</i> Specifications are located and used to identify performance/ condition of cylinders and rams. Wear and damage to cylinders and rams is identified.</p>	<p><i>Assessor guide: confirm that –</i> The methods of inspection and measurement can be described. Guides and specifications for reusable parts are used.</p>
<p>Criteria 18.52A.4.3 Seals and bearings fitted as per manufacturer specifications.</p>	<p><i>Assessor guide: observe that –</i> Seals and bearings are fitted correctly.</p>	<p><i>Assessor guide: confirm that –</i> The correct procedures for fitting bearings and seals can be given. Manufacturer installation instructions can be accessed and described.</p>
<p>Criteria 18.52A.4.4 Cylinders/rams reassembled and fitted as per manufacturer instructions.</p>	<p><i>Assessor guide: observe that –</i> Cylinder/ram reassembled in correct sequence as per manufacturer instruction. Assembly is correctly refitted to machine</p>	<p><i>Assessor guide: confirm that –</i> The sequence and procedure for reassembly of cylinder/ram can be given. Assembly and fitting instructions can be accessed and described. The procedures for refitting rams can be given.</p>
<p>Criteria 18.52A.4.5 Assembly is tested by use of machine circuit or equivalent.</p>	<p><i>Assessor guide: observe that –</i> Refitted assemblies are tested and repairs are verified on machine circuit and/or test rig.</p>	<p><i>Assessor guide: confirm that –</i> The procedures for testing and verifying repairs using machine circuits and/or test rigs are given. Necessary remedial action can be described.</p>
<p>Element 18.52A.5 Service hydraulic systems</p>		
<p>Criteria 18.52A.5.1 Hydraulic systems are serviced according to manufacturers schedules and instructions.</p>	<p><i>Assessor guide: observe that –</i> General service procedures carried out correctly.</p>	<p><i>Assessor guide: confirm that –</i> Manufacturer scheduled service timeframes and service items can be identified. Service procedures can be described.</p>

Range statement

This unit covers the skills and knowledge required to diagnose, fault-find and repair basic fluid power systems used in the earthmoving, mining, agricultural, marine and transport industries. This competency does not cover skills required in the design or modification of systems, component re-manufacture or the diagnosis, maintenance and repair of control systems (solenoid and electro proportional systems). If these skills are required, then Units 18.23B (Modify fluid power system operation), 18.47A (Diagnose and maintain electronic controlling systems on mobile plant) and 18.53B (Modify fluid power control systems) should be selected as appropriate. Repairs would typically include the assembly and fitting of hydraulic hoses, tubing and pipework. Resealing and repairs to cylinders and rams. Change out of hydraulic components such as pumps, valves and actuators and the associated remedial actions required such as system flushing and purging and setting of component parameters. Fault finding of systems according to manufacturers guidelines and procedures would typically include techniques such as pressure and flow testing, cycle times, basic interrogation of diagnostic system and may include basic electronic servicing. The general servicing of systems is also covered by this unit and includes fluid replacement, filtration requirements and oil sampling. Where Unit 18.20 (Maintain hydraulic system components) and/or 18.21A (Maintain and repair hydraulic systems) are selected, this unit should not be selected.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with fluid power for mobile plant or other competencies requiring the exercise of the skills and knowledge covered by this unit.

accepted engineering techniques, practices, processes and workplace procedures. Tasks

To undertake the elements of this competency an understanding of the concepts of fluid power and fluid power components and their application to mobile plant is required. This is considered important in the development of effective trouble shooting skills, and in the ability to work safely on systems containing stored energy devices (accumulators) and systems under pressure due to external forces.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 18.53B A Modify fluid power control systems

Band – Specialisation band B

Field – Maintenance & diagnostics

Unit Weight 6

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices
2.8C10 Perform computations

2.6C10 Plan a complete activity
2.10C5 Write reports

2.7C10 Perform computations - basic
2.14C5 Use graphical techniques and perform simple statistical computations

9.1A Draw and interpret sketch
18.2A Use power tools/hand held operations

9.2A Interpret technical drawing
18.3A Use tools for precision work

18.1A Use hand tools
18.6A Dismantle/repair/replace/assemble and fit engineering components

18.10A Equipment condition monitoring and recording

18.16B Analyse plant and equipment condition monitoring results

18.18A Maintain pneumatic system components

18.19A Maintain and repair pneumatic systems
18.22A Maintain/repair/replace fluid power controls

18.20A Maintain hydraulic system components
18.23B Modify fluid power system operation

18.21A Maintain and repair hydraulic systems
18.55A Dismantle, replace and assemble engineering components

Element 18.53B.1 Check/test control software program

Criteria 18.53B.1.1

Program steps checked against manufacturers' and site specifications using schematics, circuit and ladder diagrams.

Assessor guide: observe that –

All relevant manufacturers' and site specifications, schematics, circuit and ladder diagrams obtained in accordance with standard operating procedures. The program steps are checked for conformance to specification in accordance with standard operating procedures.

Assessor guide: confirm that –

The operational specifications of the control system can be identified. The program steps and their function can be identified.

Criteria 18.53B.1.2

Deviations determined and recorded.

Assessor guide: observe that –

Where appropriate, deviations of control software program from specification are recorded in accordance with standard operating procedure.

Assessor guide: confirm that –

The procedures for recording deviations of the control software program from specification can be identified.

Element 18.53B.2 Control system software/program corrected or modified**Criteria 18.53B.2.1**

Program deviations corrected and aligned to specification requirements using standard operating procedures.

Assessor guide: observe that –

Program deviations are corrected and aligned to specification in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for correcting deviations of the control system software from specification can be identified.

Criteria 18.53B.2.2

Modifications to program undertaken to specification requirements using standard operating procedures.

Assessor guide: observe that –

The control system software/program is modified to specification in accordance with standard operating procedures.

Assessor guide: confirm that –

The modifications to be made to the control system software can be identified. The reasons for modifying the control system software can be given.

Criteria 18.53B.2.3

Modification recorded to standard operating procedures.

Assessor guide: observe that –

The modifications made to the control system software are recorded in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for recording control system software modifications can be identified.

Criteria 18.53B.2.4

Modified program backed up to standard operating procedures.

Assessor guide: observe that –

The modified control system program is backed up in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for backing up modifications to control system programs can be identified.

Element 18.53B.3 Check/test control system inputs/outputs**Criteria 18.53B.3.1**

Input/output signals checked and assessed against operational specifications using correct and appropriate techniques, tools and equipment.

Assessor guide: observe that –

The input and output signals are checked for conformance to specification using appropriate tools, equipment and techniques in accordance with standard operating procedures.

Assessor guide: confirm that –

The tools, equipment and techniques to be used to check input and output signals for conformance to specification can be identified. The correct form of the input and output signals can be identified.

Criteria 18.53B.3.2

Faulty signals identified, repaired and recorded/reported to appropriate personnel.

Assessor guide: observe that –

Where appropriate, faulty signals identified are recorded/reported in accordance with standard operating procedure.

Assessor guide: confirm that –

The procedures for recording/ reporting faulty input/output signals can be identified.

Element 18.53B.4 Repair faulty control system input/output**Criteria 18.53B.4.1**

Faulty signal source repaired and/or replaced.

Assessor guide: observe that –

The source of the faulty signal is marked for repair or replacement in accordance with standard operating procedures. All relevant supplier catalogues are obtained in accordance with workplace procedures. Where appropriate, the faulty signal source is repaired and/or replaced in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for marking items for repair or replacement can be identified. The tools, equipment and techniques necessary to repair the signal source can be identified. The disassembly/assembly procedures to be followed when repairing signal sources can be identified. Where appropriate, replacement parts/items are selected from supplier catalogues. The specifications of the signal source can be identified.

Criteria 18.53B.4.2

Repaired/replaced signal source tested for correct operation in system and commissioned in conformance to operational specifications.

Assessor guide: observe that –

The repaired/replaced signal source is tested for correct operation in accordance with specifications and standard operating procedures. The repaired/replaced signal source is commissioned into operation in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for testing signal sources can be identified. The procedures for commissioning signal sources into operation can be identified.

Element 18.53B.5 Prepare service report**Criteria 18.53B.5.1**

Service report is prepared and completed following standard operating procedure Recommendations for improvement and repeat downtime avoidance analysis are included.

Assessor guide: observe that –

All necessary service reports are completed in accordance with standard operating procedures. All relevant historical data, reports and documents with respect to the control system's operation are obtained in accordance with workplace procedures.

Assessor guide: confirm that –

The procedures for reporting service undertaken on control systems can be identified. Any trends evident in the data collected and collated can be identified. The probable causes of any detected trends can be given. Where appropriate, improvements to the control system are recommended. Where appropriate, the reasons that the recommended improvements should be implemented can be given.

Range statement

This unit covers the skills required to alter the control parameters of fluid power control systems by system modification; this includes the ability to assess system performance based on sound working knowledge of established principles, methods and procedures. System specifications interpreted and understood from data sheets, circuit diagrams and flow diagrams. Corrections, modifications/alterations are undertaken to specifications to parts of the control system including software timers, gates, associated equipment, flow, ladder and logic diagrams. Fault finding of hardware associated with system input/outputs includes input/output circuitry, cards, external sensors, limits, mnemonic coding and associated equipment. Control systems include PCs, programmable controllers, DCS, relay logic (electric-hydraulic-pneumatic) etc. Service reports are prepared according to standard operating procedure. Modifications covered by this unit are changes to fluid power control systems that lead to desired changes in system performance. Programmable controllers include PLC and DCS or similar.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the modification of fluid power control systems or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 18.54A A Fault find, test, calibrate instrumentation systems, equipment

Band – Specialisation band A

Field – Maintenance & diagnostics

Unit Weight 8

Notes - This unit has dual status and is to be regarded as both a Specialisation band A unit and Specialisation band B unit for progression to C7 (AQF level IV)

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices

5.1A Manual soldering/desoldering - electrical/electronic components

9.1A Draw and interpret sketch

9.2A Interpret technical drawing

12.4A Precision electrical/electronic measurement

18.1A Use hand tools

18.2A Use power tools/hand held operations

18.55A Dismantle, replace and assemble engineering components

18.57A Maintain/service analog/digital electronic equipment

Pre-requisite units - Path 2

2.5C11 Measure with graduated devices

9.1A Draw and interpret sketch

9.2A Interpret technical drawing

12.2A Electrical/electronic measurement

18.1A Use hand tools

18.2A Use power tools/hand held operations

18.55A Dismantle, replace and assemble engineering components

18.64A Maintain instrumentation system components

Element 18.54A.1 Test instrumentation systems, equipment

Criteria 18.54A.1.1

Work/test requirements identified and defined to standard operating procedures.

Assessor guide: observe that –

All relevant data with respect to the operation of the instrumentation systems/equipment is obtained in accordance with workplace procedures.

Assessor guide: confirm that –

The operational requirements/ specifications of the instrumentation system/equipment can be identified. The correct operation of the instrumentation system/equipment can be explained.

Criteria 18.54A.1.2

Correct test application principles selected after inspection of instrumentation systems, equipment/components.

Assessor guide: observe that –

The instrumentation system/equipment and its components are inspected for correct operation in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for inspecting instrumentation systems/equipment and their components can be identified. The procedures and principles to be applied in testing the instrumentation system/equipment can be identified. The reasons for selecting the chosen procedures and principles can be explained.

Criteria 18.54A.1.3

Appropriate test equipment selected in accordance with defined requirements.

Assessor guide: observe that –

Assessor guide: confirm that –

The appropriate test equipment can be identified.

Criteria 18.54A.1.4

Device isolation methods/requirements observed and utilised.

Assessor guide: observe that –

The instrumentation system/equipment is isolated in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for isolating instrumentation systems/equipment can be identified. The hazards associated with fault-finding, testing and calibrating instrumentation systems/equipment can be identified.

Criteria 18.54A.1.5

Appropriate test procedures and application principles applied in assessing operation of instrumentation systems, equipment/components.

Assessor guide: observe that –

The operation of the instrumentation system/equipment and its components is tested using appropriate equipment, techniques and procedures.

Assessor guide: confirm that –

Criteria 18.54A.1.6

Normal operating characteristics of instrumentation systems, equipment/components understood to the level necessary to identify and localise faults.

Assessor guide: observe that –

Assessor guide: confirm that –

The operational specifications of the instrumentation system/equipment can be identified. Where appropriate, variations between test results and operational specifications can be identified. Where appropriate, faults in instrumentation system/equipment components can be identified.

Criteria 18.54A.1.7

Characteristics/operational function assessment procedures applied according to safety and regulatory/site specifications.

Assessor guide: observe that –

Procedures followed and safety requirements observed and met.

Assessor guide: confirm that –

The operational function of the instrumentation system/equipment can be explained. Any regulatory/safety requirements associated with the operation of the instrumentation system/equipment can be identified. The operation of the instrumentation system/equipment with respect to safety, regulatory and site requirements can be identified.

Criteria 18.54A.1.8

Characteristics and operational function checked and verified.

Assessor guide: observe that –

The operational function of the instrumentation system/equipment is checked in accordance with standard operating procedures. The operational function/malfunction of the instrumentation system/equipment is verified in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for checking and verifying the operational function of the instrumentation system/equipment can be given. The equipment and techniques necessary to test the operational function of the instrumentation system/equipment can be identified.

Element 18.54A.2 Apply data collection techniques and localise fault conditions**Criteria 18.54A.2.1**

Drawings/diagrams and operational specifications utilised in identifying and localising fault conditions.

Assessor guide: observe that –

All relevant drawings/diagrams and operational specifications are obtained in accordance with work place procedures.

Assessor guide: confirm that –

The correct function of the instrumentation system/equipment can be identified. The operational specifications of the instrumentation system/equipment can be identified.

Criteria 18.54A.2.2

Where appropriate, built-in fault indicators, error codes examined and correctly interpreted and results recorded to standard operating procedures.

Assessor guide: observe that –

Where appropriate, built-in indicators located and read/recorded in accordance with standard operating procedures. Where appropriate, error code interpretation documents obtained in accordance with workplace procedures.

Assessor guide: confirm that –

Errors indicated by built-in devices can be correctly identified.

Criteria 18.54A.2.3

Fault condition localised to major component level using appropriate test equipment principles and procedures.

Assessor guide: observe that –

Logical, safe and efficient procedures followed, using appropriate test equipment.

Assessor guide: confirm that –

Methods of determining procedures can be described.

Element 18.54A.3 Analyse and report test results**Criteria 18.54A.3.1**

Test results analysed/verified against operational specifications and localised faults confirmed.

Assessor guide: observe that –

Assessor guide: confirm that –

The test results obtained are compared to the operational specifications and the faulty component(s) confirmed.

Criteria 18.54A.3.2

Potential and real faults reported using standard operating procedures.

Assessor guide: observe that –

Real and potential faults are reported in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for reporting faults can be identified. The difference between real and potential faults can be explained.

Criteria 18.54A.3.3

Faulty conditions evaluated and corrective action planned.

Assessor guide: observe that –

Corrective action plan developed.

Assessor guide: confirm that –

The probable causes of faults in instrumentation system/equipment components can be given. The action to be taken to rectify the causes of faults in instrumentation systems/equipment can be identified. The sequence of events to be undertaken to correct faults in the instrumentation system/equipment components can be identified.

Criteria 18.54A.3.4

Action plan recorded and documented according to standard operating procedures.

Assessor guide: observe that –

The planned maintenance activities are recorded/documented in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for recording/documenting planned maintenance activities can be identified.

Element 18.54A.4 Calibrate instrumentation equipment/components**Criteria 18.54A.4.1**

Zero, span and range checks undertaken on indicators/controllers using correct and appropriate configuration.

Assessor guide: observe that –

Zero, span and range checks are undertaken on instrumentation systems/equipment, in accordance with standard operating procedures.

Assessor guide: confirm that –

The function of zero, span and range checks on instrumentation systems/equipment can be explained. The procedures for checking zero, span and range of instrumentation systems/equipment can be identified.

Criteria 18.54A.4.2

Where applicable, methods of adjustment using calibration devices are performed and documented to prescribed procedures and operational specifications.

Assessor guide: observe that –

Where appropriate, the instrumentation system/equipment is calibrated using appropriate techniques and equipment in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for calibrating and adjusting instrumentation systems/ equipment can be given. The operational specifications of the instrumentation system/equipment can be identified. The procedures for recording the calibration of instrumentation systems/equipment can be identified. The equipment required to carry out the calibration of instrumentation systems/equipment can be identified.

Range statement

Work undertaken autonomously or in a team environment. Undertake test procedures to determine correct operational function of electrical, electronic, mechanical, fluid power systems, equipment, components and associated items. Extends to the use of mechanical, pneumatic/electro-pneumatic, electronic (analog/digital) and associated instruments, measuring variables such as temp, level, pressure, flow rate, current, resistance, voltage, levels, light, density or any other process variable. Tasks undertaken in workshop/site, laboratory environments utilising system calibrators, manometers, dead weight testers, wheatstone bridge, potentiometers, frequency/signal generators, logic probes, multimeters, (analog/digital), test gauges, cathode ray oscilloscopes and other associated equipment. Operational function of instrumentation equipment/components tested and assessed against operational specifications, interpreted from data sheets and circuit diagrams in consultation with appropriate personnel where applicable. Service reports completed by appropriate means. All regulatory/legislative requirements adhered to. In this unit, major components can include transducers, power supplies, removable circuit boards, sensor units and other like components. Soldering/desoldering of electrical/electronic components requires the selection of Unit 5.1A (Manual soldering/desoldering - electrical/electronic components) or Unit 5.2A (High reliability soldering and desoldering) as appropriate. High reliability covers soldering/desoldering for the installation and fabrication of electrical/electronic components to advanced or military specifications, or where the reliability of electrical connections is critical. It also covers the soldering of electronic components where prevention of damage through electrostatic discharge or other means is required.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the fault-finding, testing, calibrating of instrumentation systems and equipment or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 18.55A A Dismantle, replace and assemble engineering components

Band – Specialisation band A

Field – Maintenance & diagnostics

Unit Weight 3

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices
18.2A Use power tools/hand held operations

9.2A Interpret technical drawing

18.1A Use hand tools

Pre-requisite units - Path 2

2.5C11 Measure with graduated devices
18.2A Use power tools/hand held operations

9.1A Draw and interpret sketch

18.1A Use hand tools

Element 18.55A.1 Dismantle engineering components

Criteria 18.55A.1.1

Engineering components are inspected and task requirements analysed.

Assessor guide: observe that –

All relevant instructions, drawings and specifications are obtained in accordance with workplace procedures.

Assessor guide: confirm that –

The tasks to be performed can be identified.

Criteria 18.55A.1.2

Appropriate tools and equipment selected and component/s prepared for dismantling.

Assessor guide: observe that –

The component is prepared for dismantling in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for dismantling the component can be identified. The tools and equipment to be used to dismantle the components can be identified. The reasons for selecting the tools and equipment can be given.

Criteria 18.55A.1.3

Component dismantled using standard operating procedures, tools and equipment.

Assessor guide: observe that –

The components are dismantled using appropriate techniques, tools and equipment in accordance with standard operating procedures.

Assessor guide: confirm that –

The reasons for utilising the selected technique to dismantle the components can be given. Two examples of situations where other dismantling techniques may be selected can be given.

Criteria 18.55A.1.4

Engineering components are clearly marked to aid reassembly.

Assessor guide: observe that –

The component parts are appropriately marked for identification purposes in accordance with standard operating procedures.

Assessor guide: confirm that –

The reasons for identifying parts can be explained. The procedures for marking component parts can be identified.

Element 18.55A.2 Identify faulty components**Criteria 18.55A.2.1**

Specifications for components obtained from appropriate source and interpreted and understood.

Assessor guide: observe that –

All relevant specifications and data are obtained in accordance with standard operating procedures.

Assessor guide: confirm that –

The specifications of the component can be identified. Alternative sources of component specifications can be given.

Criteria 18.55A.2.2

Damaged or faulty components assessed against specifications.

Assessor guide: observe that –

The components are visually and dimensionally checked for conformance to specification in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for checking components for conformance to specification can be given. The equipment necessary to check components for conformance to specification can be identified. The consequences of having components that do not comply with specifications can be explained.

Criteria 18.55A.2.3

Faulty components are identified for repair, replacement or adjustment.

Assessor guide: observe that –

Where appropriate, faulty parts are marked for repair, replacement or adjustment in accordance with standard operating procedures.

Assessor guide: confirm that –

The reason(s) for identifying parts for repair, replacement or adjustment can be given. Two examples of situations where parts would be identified for repair can be given. Two examples of situations where parts would be identified for replacement can be given.

Element 18.55A.3 Select replacement components

Criteria 18.55A.3.1

Where applicable, replacement and/or repaired parts are selected for reassembly.

Assessor guide: observe that –

Replacement parts selected confirm to specifications All relevant supplier catalogues are obtained in accordance with workplace procedures.

Assessor guide: confirm that –

The specifications of the components to be replaced can be identified. The features and/or dimensions upon which replacement parts are to be selected can be identified. The process of identifying replacement parts from "third party" suppliers' catalogues can be described.

Element 18.55A.4 Assemble engineering components into assemblies or sub-assemblies

Criteria 18.55A.4.1

Appropriate techniques are applied in the preparation, assembly and adjustment of components using fastening equipment and methods which ensure conformance to specifications, operational performance, quality and safety of the completed assembly.

Assessor guide: observe that –

The components are prepared and assembled using appropriate fitting techniques and principles in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for assembling components can be identified The requirements of the assembly in terms of specifications, operational performance, quality and safety can be identified. Two examples of situations where other assembly techniques may be used can be given.

Criteria 18.55A.4.2

Correct lubrication, packing, sealing materials selected and applied correctly in conformance to job specifications.

Assessor guide: observe that –

Where appropriate, lubricants are correctly applied to the assembly in accordance with specifications and standard operating procedures. Where appropriate, packing and/or sealing materials are applied in accordance with specifications and standard operating procedures.

Assessor guide: confirm that –

The procedures for lubricating the assembly can be identified. The application of different types of lubricants can be identified The consequences of using inappropriate or no lubricant can be explained. The function of packing and sealing materials can be explained. The applications of different types of packing and sealing materials can be identified. The reasons for selecting chosen packing and/or sealing materials can be explained. The procedures for installing packing and sealing materials can be given.

Criteria 18.55A.4.3

Final component assembly inspected, tested and adjusted as necessary for compliance with operational specifications and returned to use according to standard operating procedure.

Assessor guide: observe that –

The final assembly is inspected and checked for conformance to specification. Where appropriate the final assembly is returned into use in accordance with standard operating procedures.

Assessor guide: confirm that –

The checks to be undertaken during inspection of the final assembly can be identified. The procedures for returning components/assemblies into use can be identified.

Range statement

Work undertaken autonomously or in a team environment using predetermined standards of quality, safety and workshop procedures. This unit involves the dismantling, inspection, replacement, assembling of engineering components. All specifications interpreted from manufacturers' manuals, engineering drawings, detailed/technical sketches and associated data sheets. Tasks are undertaken utilising engineering principles, designated procedures, appropriate tools, equipment and safe workshop practices. Replacement parts are selected from manufacturers' catalogues, etc. Appropriate techniques utilised in the assembly of component parts using fastening equipment and methods which ensure conformance to specifications, operational performance, quality and safety; this may include the straightforward removal and replacement of pre-manufactured bearings and seals. Appropriate lubrication, packing, sealing materials are selected and applied in conformance to standard operating procedure. Where precision mechanical measurement is required, then Unit 12.3A (Precision mechanical measurement) must also be selected.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the dismantling, replacement and assembly of engineering components or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 18.56A A Diagnose and repair analog equipment and components

Band – Specialisation band A

Field – Maintenance & diagnostics

Unit Weight 10

Notes - This unit has dual status and is to be regarded as both a Specialisation band A unit and Specialisation band B unit for progression to C7 (AQF level IV)

Pre-requisite units - Path 1

5.1A Manual soldering/desoldering - electrical/electronic components

9.2A Interpret technical drawing

12.4A Precision electrical/electronic measurement

18.1A Use hand tools

18.57A Maintain/service analog/digital electronic equipment

Element 18.56A.1 Locate fault in electronic system/sub-assembly

Criteria 18.56A.1.1

System/sub-assembly functions and principles determined and understood eg: reference to equipment manuals, circuit diagrams etc..

Assessor guide: observe that –

All relevant circuit diagrams, manuals, specifications, schematics, maintenance records, etc. obtained in accordance with workplace procedures.

Assessor guide: confirm that –

The function(s) of the electronic system/sub-assembly can be identified. The electronic principles utilised in the operation of the system/sub-assembly can be explained.

Criteria 18.56A.1.2

Built-in test functions run and fault indicator error codes and appropriate maintenance records checked and reviewed.

Assessor guide: observe that –

Where appropriate, built-in test functions are run in accordance with standard operating procedures. Where appropriate, built-in fault indicators are located and read/recorded in accordance with standard operating procedures. Where appropriate, error code interpretation documents are obtained in accordance with workplace procedures.

Assessor guide: confirm that –

The procedures for running built-in test functions can be identified. Errors indicated by built-in devices can be correctly identified.

Criteria 18.56A.1.3

Fault symptoms reproduced, where appropriate, and verified using appropriate technique.

Assessor guide: observe that –

Where appropriate, the fault symptoms are reproduced in the system and the fault verified using appropriate test equipment and techniques in accordance with standard operating procedures.

Assessor guide: confirm that –

The symptoms of the fault in the electronic system/sub-assembly can be identified. The purpose of reproducing system/sub-assembly fault symptoms can be explained. The test equipment and techniques necessary to confirm electronic system/sub-assembly faults can be identified. The procedures for verifying faults in electronic systems/sub-assemblies can be given.

Criteria 18.56A.1.4

Where appropriate, faulty sub-assembly isolated and removed from electronic system using correct and appropriate tools and techniques.

Assessor guide: observe that –

Where appropriate, the electronic system/sub-assembly is isolated from the power supply in accordance with standard operating procedures. Where appropriate the faulty sub-assembly is removed from the electronic system using appropriate tools and techniques in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for isolating electronic systems/sub-assemblies can be identified. The hazards associated with electronic systems/sub-assemblies can be identified. The procedures for removing sub-assemblies from electronic systems can be given. The tools and techniques to be used to remove the sub-assemblies from the electronic system can be identified.

Criteria 18.56A.1.5

Sub-assembly checked and tested using correct and appropriate test equipment and techniques.

Assessor guide: observe that –

The electronic sub-assembly is checked for conformance to specification using appropriate equipment and techniques in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for testing faulty sub-assemblies can be given. The operational specifications of the sub-assembly can be identified. The equipment and techniques to be used to test the faulty sub-assemblies can be identified. The test results obtained are compared with the operational specifications and the faulty components identified. The probable causes of component failure can be given.

Criteria 18.56A.1.6

Faulty component/s identified and/or fault cause isolated.

Assessor guide: observe that –

Assessor guide: confirm that –

Element 18.56A.2 Repair/replace faulty components

Criteria 18.56A.2.1

Faulty component removed, where required, using correct and appropriate tools and techniques.

Assessor guide: observe that –

Where appropriate, faulty components are removed from the electronic system using appropriate tools and techniques in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for removing faulty components from electronic systems can be identified. The tools and techniques to be used to remove components from electronic systems can be identified.

Criteria 18.56A.2.2

Faulty component repaired/replaced in accordance with manufacturers' recommended procedures or to standard operating procedures.

Assessor guide: observe that –

All relevant suppliers' catalogues are obtained in accordance with work place procedures. Faulty components are repaired/replaced using appropriate tools and equipment in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for repairing faulty components can be identified. Replacement parts can be selected from suppliers' catalogues in conformance to specification. All tools and equipment necessary to repair faulty components can be identified.

Criteria 18.56A.2.3

Repaired/replacement components fitted in accordance with manufacturers' recommended procedure or to standard operating procedure using correct and appropriate tools and techniques.

Assessor guide: observe that –

The repaired/replaced components are refitted into the sub-assembly using appropriate tools and techniques in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for fitting repaired/ replaced components into sub-assemblies can be identified. The tools and techniques required to refit the repaired/replaced components into sub-assemblies can be identified.

Criteria 18.56A.2.4

Where appropriate, repaired sub-assembly refitted to electronic system using correct and appropriate tools and techniques.

Assessor guide: observe that –

Where appropriate, the repaired sub-assembly is refitted into the electronic system using appropriate tools and techniques in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for fitting repaired sub-assemblies into electronic systems can be identified.

Criteria 18.56A.2.5

Systems/sub-assembly checked and tested for correct operational compliance with specifications utilising correct and appropriate test procedures and equipment.

Assessor guide: observe that –

The electronic system/sub-assembly is tested for compliance with specifications using appropriate test equipment and techniques, in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for testing electronic system/sub-assembly performance can be identified. The operational specifications of the electronic system/sub-assembly can be identified. The test equipment and techniques necessary to check electronic system/sub-assembly performance can be identified.

Range statement

Work undertaken autonomously or in team environment using predetermined standards of quality, safety and work procedures. Diagnose includes working from first principles to identify non-routine and undefined faults. Work performed in laboratory, workshops or on-site environments. Correct and appropriate tools and equipment include continuity testers, ammeters, voltmeters, cathode ray oscilloscopes, frequency counters, signal generators, digital probes etc. Fault finding techniques include signal injection, substitution, monitoring, heating/cooling etc. Electronic sub-assemblies can form part of electronic systems or equipment including computer, control, safeguarding, monitoring, telecommunications, interface or security equipment etc. Components may include discrete component assemblies or individual components such as resistors, switching devices, capacitors, transformers, solenoids, tubes, semi-conductors etc. All specifications and procedures gained from schematics, circuit drawings, engineering data sheets or manufacturers' hand books. Unit 5.2A (High reliability soldering and desoldering) must also be selected if soldering of components is required to advanced or military specifications, where the reliability of electrical connections is critical, or where surface mounted devices are being soldered/de-soldered. Where termination of cables is involved, Unit 10.2A (Terminate and connect electrical wiring) and/or Unit 18.63A (Terminate signal and data cables) must also be selected. All work and work practices undertaken to regulatory and legislative requirements.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the diagnosis and repair of electronic systems/sub-assemblies (analog) or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 18.57A A Maintain/service analog/digital electronic equipment

Band – Specialisation band A

Field – Maintenance & diagnostics

Unit Weight 6

Pre-requisite units - Path 1

5.1A Manual soldering/desoldering - electrical/electronic components

9.2A Interpret technical drawing

12.4A Precision electrical/electronic measurement

18.1A Use hand tools

Element 18.57A.1 Undertake maintenance checks and routine tests

Criteria 18.57A.1.1

Electronic equipment, functions determined and understood by reference to circuit diagrams, equipment manuals and/or consultation with equipment operator where appropriate.

Assessor guide: observe that –

All relevant circuit diagrams, manuals, specifications, schematics, maintenance records, etc. obtained in accordance with workplace procedures. Where appropriate, equipment operator consulted with respect to equipment operation.

Assessor guide: confirm that –

The function(s) of the electronic equipment can be identified.

Criteria 18.57A.1.2

Equipment built-in test functions run and results recorded to standard operating procedures where appropriate.

Assessor guide: observe that –

Where appropriate, built-in test functions are run in accordance with standard operating procedures. Where appropriate, built-in fault indicators are located and read/recorded in accordance with standard operating procedures. Where appropriate, error code interpretation documents are obtained in accordance with workplace procedures.

Assessor guide: confirm that –

The procedures for running built-in test functions can be identified. Errors indicated by built-in devices can be correctly identified.

Criteria 18.57A.1.3

Built-in faults/status display noted and recorded to standard operating procedure.

Assessor guide: observe that –

Where appropriate, the faults and/or equipment status indicated by built-in test functions/displays are recorded in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for recording faults and/or equipment status identified by built-in test functions/displays can be identified.

Criteria 18.57A.1.4

Equipment/sub-assemblies, components, connections, terminations etc. checked visually and with correct and appropriate test equipment and techniques.

Assessor guide: observe that –

The electronic equipment/sub-assemblies, components, connections and terminations are checked for conformance to specifications using appropriate test equipment and techniques in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for checking the following for compliance with specifications can be identified: - electronic - equipment/sub-assemblies - components - connections - terminations.

Criteria 18.57A.1.5

Faulty components removed and replaced where appropriate.

Assessor guide: observe that –

Where appropriate, faulty components are removed from the electronic equipment using appropriate tools and techniques in accordance with standard operating procedures. Where appropriate, the replacement component is refitted into the electronic equipment using appropriate tools and techniques in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for removing faulty components from electronic equipment can be identified. The tools and techniques to be used to remove/replace components from/into electronic equipment can be identified. The procedures for fitting replacement components into electronic equipment can be identified.

Criteria 18.57A.1.6

All results checked for compliance with manufacturers' requirements or specification, results recorded to standard operating procedures.

Assessor guide: observe that –

The electronic equipment is checked for conformance to specification using appropriate equipment and techniques in accordance with standard operating procedures. The results of the tests undertaken on the electronic equipment are recorded in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for testing electronic equipment can be given. The operational specifications of the electronic equipment can be identified. The equipment and techniques to be used to test the electronic equipment can be identified. The test results obtained are compared with the operational specifications and where appropriate, the faulty components identified. The procedures for recording electronic equipment test results can be identified.

Element 18.57A.2 Maintain and/or service electronic equipment**Criteria 18.57A.2.1**

Where appropriate, isolate sub-assemblies to standard operating procedures.

Assessor guide: observe that –

Where appropriate, the electronic sub-assembly is isolated from the power supply in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for isolating electronic equipment/sub-assemblies can be identified. The hazards associated with electronic sub-assemblies can be identified.

Criteria 18.57A.2.2

Electronic equipment/sub-assemblies adjusted to specifications, manufacturers' requirements and/or standard operating procedures using correct and appropriate techniques, tools and equipment.

Assessor guide: observe that –

The electronic equipment/sub-assemblies are adjusted/tuned in accordance with specifications, using appropriate tools, techniques and equipment in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for adjusting the electronic equipment/sub-assembly can be identified. The tools, equipment and techniques to be used to adjust the electronic equipment/sub-assembly can be identified. The operational specifications of the electronic equipment/sub-assembly can be identified.

Element 18.57A.3 Return electronic equipment to service**Criteria 18.57A.3.1**

Equipment/sub assemblies returned into service utilising correct and appropriate techniques and procedures.

Assessor guide: observe that –

The electronic equipment/sub-assembly is returned into service in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for returning to service the electronic equipment/sub-assembly can be identified. The equipment and techniques to be used to return the electronic equipment/sub-assembly back into service can be identified.

Criteria 18.57A.3.2

Equipment/sub assemblies checked for operational compliance to specifications and/or manufacturers requirements and documentation requirements are carried out to standard operating procedure.

Assessor guide: observe that –

The electronic equipment/sub-assembly is checked for conformance to specification, using appropriate test equipment and techniques in accordance with standard operating procedures. The test results are recorded in accordance with standard operating procedures.

Assessor guide: confirm that –

The operational specifications of the electronic equipment/sub-assembly can be identified. The procedures for recording/ documenting the maintenance servicing of the electronic equipment/sub-assembly can be given. The test equipment and techniques to be used to check the electronic equipment/sub-assembly for conformance to specification can be identified. The procedures for testing the electronic equipment/sub-assembly for compliance with specification can be identified.

Range statement

This unit covers the testing and maintenance of electronic equipment and systems, it covers situations in which a series of checks and pre-determined tests is applied in accordance with work shop manuals, testing procedures etc. This unit also covers the replacement of faulty components identified during these tests. Work ordinarily undertaken with minimal assistance but could include working as part of team. Work undertaken in field (in situ) or workshop/laboratory environment. Check, tests, adjustments and services undertaken on a wide range of equipment utilised in engineering environments including telecommunication, process control, computer systems, security monitoring and alarm systems etc. Correct and appropriate tools and equipment includes the use of voltmeters, ammeters, cathode ray oscilloscopes, frequency counters, continuity testers etc, hand tools and soldering and de-soldering devices etc. Components may include discrete component, circuit boards, connectors, plug-in items, power supplies and the like. Where termination of cables is involved Unit 10.2A (Terminate and connect electrical wiring) and/or Unit 18.63A (Terminate signal and data cables) must also be selected. If diagnosis and repair of electronic equipment is undertaken to component level Unit 18.56A (Diagnose and repair analog equipment and components) and/or Unit 18.65A (Diagnose and repair digital equipment and components) should also be selected. For higher level diagnostic skills see Unit 18.56A (Diagnose and repair analog equipment and components) or Unit 18.65A (Diagnose and repair digital equipment and components) is used. All specifications and procedures obtained from circuit drawings, engineering data sheets or manufacturers hand books. All work and work practices undertaken to regulatory and legislative requirements.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the maintenance and calibration of electronic systems and equipment or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Special notes

During assessment the individual will - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 18.58A B Modify electronic equipment

Band – Specialisation band A

Field – Maintenance & diagnostics

Unit Weight 4

This unit covers the competencies required to modify and recommission equipment. Modifications can vary from minor calibrations and alteration requirement to experimental and development modifications of a complex nature and can include replacement and /or alterations of system equipment, sub assemblies, PCBs and components on analog and digital electronic systems

Note - This unit has dual status and is to be regarded as both a Specialisation band A unit and Specialisation band B unit for progression to C5 (AQF level V)

Pre-requisite units - Path 1

12.4A Precision electrical/electronic measurement
18.56A Diagnose and repair analog equipment and components

18.1A Use hand tools
18.65A Diagnose and repair digital equipment and components

18.2A Use power tools/hand held operations

Element 18.58A.1 Modify equipment

Criteria 18.58A.1.1

Modification requirements determined and understood by reference to circuit diagrams, schematics, equipment manuals and /or consultation with technical authority where appropriate

Assessor guide: observe that –

Relevant circuit diagrams, schematics, manuals, etc. obtained in accordance with work site procedures Where appropriate, technical authority consulted in accordance with work site procedures

Assessor guide: confirm that –

Modification requirements can be identified Sources of technical advice can be identified

Criteria 18.58A.1.2

Equipment isolated to standard operational procedures

Assessor guide: observe that –

Equipment is isolated in accordance with work site procedures Isolated equipment is tagged in accordance with work site procedures Isolation of equipment is verified in accordance with work site procedures

Assessor guide: confirm that –

Equipment isolation procedures can be identified

Criteria 18.58A.1.3

Equipment removed from system, if required, using correct and appropriate techniques and equipment

Assessor guide: observe that –

Where appropriate, equipment is removed from system in accordance with work site procedures

Assessor guide: confirm that –

The procedures for removing equipment from the system can be identified

Criteria 18.58A.1.4

Modification carried out to equipment/sub-assembly/component in accordance with specifications or application requirements using correct and appropriate techniques and equipment

Assessor guide: observe that –

The modification is carried out to specification in accordance with work site procedures

Assessor guide: confirm that –

The modification to be carried out can be identified The specifications applicable to the modification can be identified Any permits/approvals required can be identified The tools and equipment necessary to carry out the modification can be identified

<p>Criteria 18.58A.1.5 Sub-assembly refitted to equipment, if required, using correct and appropriate technique and equipment</p>	<p><i>Assessor guide: observe that –</i> Where appropriate, sub-assembly/equipment refitted to system in accordance with work site procedures</p>	<p><i>Assessor guide: confirm that –</i> Any specialised fitting requirements can be identified</p>
<p>Element 18.58A.2 Return equipment to service</p>		
<p>Criteria 18.58A.2.1 Where required, circuit diagrams, schematics, equipment manuals etc. amended to reflect modifications undertaken</p>	<p><i>Assessor guide: observe that –</i> Where appropriate, circuit diagrams, schematics, equipment manuals, specifications, etc. affected by the modifications are amended to reflect the modifications, in accordance with work site procedures</p>	<p><i>Assessor guide: confirm that –</i> The modifications undertaken can be identified</p>
<p>Criteria 18.58A.2.2 Checks and tests undertaken to specifications using correct and appropriate techniques, test equipment and tools</p>	<p><i>Assessor guide: observe that –</i> The modified electronic equipment is tested to ensure conformance to specifications in accordance with work site procedures</p>	<p><i>Assessor guide: confirm that –</i> The electronic equipment specifications can be identified Appropriate test equipment and its application can be identified Appropriate testing procedures can be identified</p>
<p>Criteria 18.58A.2.3 Equipment/system recommissioned using correct and appropriate techniques and procedures</p>	<p><i>Assessor guide: observe that –</i> The electronic equipment is recommissioned in accordance with work site procedures</p>	<p><i>Assessor guide: confirm that –</i> The procedures for recommissioning electronic equipment can be identified</p>
<p>Criteria 18.58A.2.4 Equipment/system checked for operational compliance with specifications</p>	<p><i>Assessor guide: observe that –</i> The equipment/system is checked for conformance to operational specifications in accordance with work site procedures</p>	<p><i>Assessor guide: confirm that –</i> The operational specification of the equipment/system can be identified</p>

Range statement

Work undertaken autonomously and/or as a member of team. Professional or higher level technical assistance may be utilised for determining modification. Work undertaken in field or workshop/laboratory. Modifications include minor adjustments and alterations requirements through to experimental and development modifications of a complex nature and can include replacement and/or alterations of system equipment, sub-assemblies, PCBs and components etc. on analog and digital electronic equipment and systems. All work and work practices undertaken to regulatory or legislative requirements. Where drafting skills are required, then Unit 9.3A (Prepare basic engineering drawing) or Unit 9.4B (Electrical/electronic detail drafting) should be considered. Unit 5.2A (High reliability soldering and desoldering) must also be selected if soldering of components is required to advanced or military specifications, where the reliability of electrical connections is critical, or where surface mounted devices are being soldered/de-soldered.

Evidence guide**Assessment context**

This unit should be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the modification of electronic equipment, or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant data sheets, catalogues, circuit diagrams and engineering drawings. The candidate will be required to: - Orally, or other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment, the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities.

Unit MEM 18.59B A Modify electronic systems

Band – Specialisation band B

Field – Maintenance & diagnostics

Unit Weight 4

Pre-requisite units - Path 1

5.1A Manual soldering/desoldering - electrical/electronic components

9.1A Draw and interpret sketch

9.2A Interpret technical drawing

12.4A Precision electrical/electronic measurement

18.1A Use hand tools

18.2A Use power tools/hand held operations

18.56A Diagnose and repair analog equipment and components

18.57A Maintain/service analog/digital electronic equipment

18.58A Modify electronic equipment

18.65A Diagnose and repair digital equipment and components

Element 18.59B.1 Modification determined

Criteria 18.59B.1.1

Modification requirements determined and understood by reference to schematics, circuit diagrams, documentation and/or consultation with appropriate authority.

Assessor guide: observe that –

All relevant instructions, schematics, circuit diagrams are obtained in accordance with work place procedures.

Where appropriate, technical advisers are consulted in accordance with work place procedures.

Assessor guide: confirm that –

The modifications to be made to the electronic system can be identified. The reasons for undertaking the modification to the electronic system can be given. The appropriate personnel to consult for technical advice can be identified. The hazards associated with the electronic system can be identified.

Criteria 18.59B.1.2

Where appropriate, maintenance reports and system output information analysed to confirm the need and nature of modification.

Assessor guide: observe that –

All relevant maintenance reports and system output information is obtained in accordance with workplace procedures.

Assessor guide: confirm that –

The data obtained is collated and any trends and/or deviations from specification are identified. The probable causes for any detected trends and/or deviations from specification can be given. The likely effect of the proposed modifications on system performance can be explained.

Criteria 18.59B.1.3

Scope and nature of modifications determined, recorded to standard operating procedures and confirmed with appropriate authority.

Assessor guide: observe that –

The proposed modifications are recorded in accordance with standard operating procedures. Approval to carry out the proposed modifications is obtained from the appropriate authority.

Assessor guide: confirm that –

The procedures for recording modifications to be made to electronic systems can be identified. The appropriate authority to authorise modifications to electronic systems can be identified.

Element 18.59B.2 Undertake modification(s)**Criteria 18.59B.2.1**

Modification/s undertaken using correct and appropriate techniques, tools and procedures.

Assessor guide: observe that –

The electronic system is modified using appropriate tools and techniques in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures to be followed when undertaking modifications to electronic systems can be identified. The tools and techniques to be used to modify the electronic system can be identified.

Criteria 18.59B.2.2

Correct and appropriate amendments undertaken to documentations, circuit drawing etc. using standard operating procedures.

Assessor guide: observe that –

All relevant documents, circuit drawings, schematics etc. are amended in accordance with the modifications made to the electronic system and standard operating procedures.

Assessor guide: confirm that –

The procedures for amending documents, circuit drawings, schematics etc. can be identified. The appropriate authority to authorise changes to documentation, circuit drawings, schematics etc. can be identified.

Element 18.59B.3 Test and evaluate modified electronic systems**Criteria 18.59B.3.1**

Modifications checked/tested and evaluated for compliance with desired outcome or specification using correct and appropriate techniques, tools and equipment.

Assessor guide: observe that –

The modified electronic system is checked for conformance to specification using appropriate test equipment and techniques in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for checking the performance of the modified electronic system can be identified. The test equipment and techniques to be used to evaluate the modified electronic system can be identified. The operational specifications to be achieved by the modified electronic system can be identified.

Criteria 18.59B.3.2

Additional modification changes, if required, recommended using standard operating procedures.

Assessor guide: observe that –

Where appropriate, additional modifications are recommended in accordance with standard operating procedures.

Assessor guide: confirm that –

Any deviations/variations of test results from operational specifications can be identified. The probable causes of any deviations/variations from specification can be given. The likely effect of further modifications on electronic system performance can be explained.

Range statement

Work is undertaken autonomously or in a team environment. Professional or higher level technical assistance may be utilised in determining modifications. Work undertaken in field, workshop/laboratory. Modification proposals are approved by appropriate authority. Modifications include approved design changes and/or replacement of components or sub-assemblies on electronic analog and digital systems. All work undertaken to regulatory or legislative requirements. Where drafting skills are required, then Unit 9.3A (Prepare basic engineering drawing) or Unit 9.4B (Electrical/electronic detail drafting) should be considered. Unit 5.2A (High reliability soldering and desoldering must also be selected if soldering of components is required to advanced or military specifications, where the reliability of electrical connections is critical, or where surface mounted devices are being soldered/de-soldered.

Evidence guide

Assessment context

This unit should be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the modification of electronic systems or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 18.60A A Maintain, repair control instrumentation - single and multiple loop control systems

Band – Specialisation band A

Field – Maintenance & diagnostics

Unit Weight 8

This unit covers the competencies required to determine control loop characteristics, monitor and record operation of panel mounted, split architecture single/multiple loop control instruments. It covers the ability to localise the fault condition, replace or repair faulty conditions, calibrate and adjust control instrumentation, recommission

and complete service reports. The tasks undertaken use pneumatic calibrators, electronic calibrators and test equipment (current, voltage and digital).

Note - This unit has dual status and is to be regarded as both a Specialisation band A unit and Specialisation band B unit for progression to C5 (AQF level V)

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices

5.1A Manual soldering/desoldering - electrical/electronic components

9.1A Draw and interpret sketch

9.2A Interpret technical drawing

12.4A Precision electrical/electronic measurement

18.1A Use hand tools

18.2A Use power tools/hand held operations

18.54A Fault find, test, calibrate instrumentation systems, equipment

18.55A Dismantle, replace and assemble engineering components

18.57A Maintain/service analog/digital electronic equipment

18.62A Install, maintain and calibrate instrumentation sensors, transmitters and final control elements

Pre-requisite units - Path 2

2.5C11 Measure with graduated devices

9.1A Draw and interpret sketch

9.2A Interpret technical drawing

12.2A Electrical/electronic measurement

18.1A Use hand tools

18.2A Use power tools/hand held operations

18.54A Fault find, test, calibrate instrumentation systems, equipment

18.55A Dismantle, replace and assemble engineering components

18.62A Install, maintain and calibrate instrumentation sensors, transmitters and final control elements

18.64A Maintain instrumentation system components

Element 18.60A.1 Determine control loop operating characteristics

Criteria 18.60A.1.1

Engineering specifications, technical information and historical trends examined for relevant data

Assessor guide: observe that –

All relevant engineering specifications, technical information, historical records and documents are obtained in accordance with workplace procedures

Assessor guide: confirm that –

Relevant data on the control loop characteristics can be identified Where appropriate, trends are identified from the data

Criteria 18.60A.1.2

System specifications, operational data and other relevant data sources examined, read, interpreted and relevant conclusions noted

Assessor guide: observe that –

The specifications of system components and operational data are obtained in accordance with workplace procedures

Assessor guide: confirm that –

The specifications of each system component can be identified Where appropriate, trends are identified from operational data

Criteria 18.60A.1.3

Consultation with system operators and other relevant plant personnel is carried out, relevant data extracted and documented by appropriate means

Assessor guide: observe that –

System operators and other relevant plant personnel are consulted with respect to the control loop characteristics
The information obtained from system operators and other relevant personnel is documented in accordance with standard operating procedures

Assessor guide: confirm that –

The procedures for documenting information gained by consultation with personnel can be given Where appropriate, relevant data and/or trends are identified

Criteria 18.60A.1.4

Using knowledge of all control loop device characteristics, controller mode principles and adjustment methods, operation of the system is

Assessor guide: observe that –

The operation of the system is observed to confirm function/malfunction of the system and/or its

Assessor guide: confirm that –

The reasons for observing the system in operation can be explained The following can be identified for the given control system: - the characteristics of the external control device - the controller modes - the means of signal transmission - the principles of operation of the final control element - the procedures for calibrating the control system - the procedures for adjusting the control system

Criteria 18.60A.1.5

Appropriate test equipment and testing procedures used

Assessor guide: observe that –

The control system is tested using appropriate equipment and techniques in accordance with standard operating procedures

Assessor guide: confirm that –

The equipment necessary to test the control system can be identified The reasons for selecting the chosen test equipment can be given The test procedures to be followed can be identified

Criteria 18.60A.1.6

Fault finding and diagnostic techniques utilised

Assessor guide: observe that –

The operational characteristics of control devices, signal conversion instruments and final control elements are checked for conformance to specification, using appropriate test equipment and techniques in accordance with standard operating procedures Where appropriate, faults/defects in control system components are correctly identified

Assessor guide: confirm that –

Fault finding and diagnostic tests to be applied to control devices, signal conversion instruments and final control elements can be identified The necessary test equipment and techniques can be identified The procedures for testing control system components can be identified

Criteria 18.60A.1.7

Relevant data collected by appropriate means, from all sources including maintenance records, fault indicators, charts, error codes operational symptoms, observation monitoring and consultation with appropriate personnel

Assessor guide: observe that –

In-built fault indicators and error codes are located/read in accordance with standard operating procedures

Assessor guide: confirm that –

The errors indicated by in-built devices can be correctly identified All relevant data from all sources is collected and collated for analysis

Element 18.60A.2 Monitor and record operation of a control loop**Criteria 18.60A.2.1**

Pneumatic, electrical and electronic circuit diagrams interpreted and understood

Assessor guide: observe that –

All relevant pneumatic, electrical and electronic circuit diagrams obtained in accordance with work place procedures

Assessor guide: confirm that –

The correct function of the circuits can be identified
The components of the control loop can be identified

Criteria 18.60A.2.2

Using knowledge of all control loop device characteristics, controller mode principles and calibration/adjustment methods, check/test and monitor loop operation from the controller response to set point and manual output changes using correct test equipment, principles and procedures

Assessor guide: observe that –

The control loop operation is tested and monitored for correct operation using appropriate test equipment and techniques in accordance with standard operating procedures

Assessor guide: confirm that –

The characteristics of the control loop devices can be given The calibration and adjustment methods for the control loop devices can be explained The principles and modes of operation of the system controller can be explained The test equipment and techniques necessary to monitor and record the operation of the control system can be identified The reasons for selecting the chosen test equipment and techniques can be explained The test procedures to be applied to the control system can be identified

Criteria 18.60A.2.3

Interpret software configuration data for digital control systems

Assessor guide: observe that –

All relevant software data is obtained in accordance with work place procedures

Assessor guide: confirm that –

The configuration of the digital control system software can be identified

Criteria 18.60A.2.4

Operational responses monitored and recorded by appropriate means

Assessor guide: observe that –

The operational responses of the control system are monitored and recorded in accordance with standard operating procedures

Assessor guide: confirm that –

The operational responses to be monitored can be identified The procedures for recording test and operational data can be identified

Criteria 18.60A.2.5

Fault finding and diagnostic techniques utilised throughout checking and testing procedures including simple and multi-controller type control schemes

Assessor guide: observe that –

Appropriate fault-finding and diagnostic techniques and procedures are used throughout the monitoring and testing process

Assessor guide: confirm that –

The need to employ appropriate fault-finding and diagnostic techniques throughout the monitoring and testing process can be explained

Criteria 18.60A.2.6

Diagnostic results and conclusions analysed against predetermined operational specifications

Assessor guide: observe that –

The collated data is compared with the operational specifications of the control system The results of the analysis of collated data and any conclusions reached are documented in accordance with standard operating procedures

Assessor guide: confirm that –

Where appropriate, deviations/ variations from specification can be identified The probable reasons for any deviations/variations from specification can be given The procedures for documenting control system tests and analysis can be identified

Element 18.60A.3 Localise fault condition**Criteria 18.60A.3.1**

Circuits tested to the level necessary to identify and localise faults

Assessor guide: observe that –

The circuits are tested for continuity/fault in accordance with standard operating procedures

Assessor guide: confirm that –

The procedures for testing circuits can be identified
The hazards associated with testing circuits can be identified
Where appropriate, the procedures for isolating the control system and its components can be identified

Criteria 18.60A.3.2

Drawings/diagrams, operational testing data utilised in identifying and localising fault conditions

Assessor guide: observe that –

All relevant drawings, diagrams and operational test data are collected and collated to assist in localising fault conditions

Assessor guide: confirm that –

The relevant drawings, diagrams and operational test data can be identified

Criteria 18.60A.3.3

Fault condition localised and verified to major component level using appropriate test equipment, principles and procedures

Assessor guide: observe that –

Apparent faults are verified using appropriate test equipment and techniques in accordance with standard operating procedures

Assessor guide: confirm that –

The procedures for verifying apparent faults in circuits and/or control system components can be given
The test equipment and techniques required to verify an apparent fault can be identified

Element 18.60A.4 Replace or repair faulty condition**Criteria 18.60A.4.1**

Components dismantled for repair or replacement using appropriate tools, equipment and procedures

Assessor guide: observe that –

Components marked for repair or replacement in accordance with standard operating procedures
Serviceable items are dismantled/ disassembled in accordance with standard operating procedures

Assessor guide: confirm that –

The procedures for marking components for repair or replacement can be identified
The procedures for dismantling/ disassembling components for repair or replacement can be identified

Criteria 18.60A.4.2

Replaceable items are selected from manufacturers' catalogues, spare parts lists, or data sheets

Assessor guide: observe that –

All relevant manufacturers'/ suppliers' catalogues, spare parts lists or data sheets obtained in accordance with workplace procedures

Assessor guide: confirm that –

Appropriate replacement parts can be identified

Criteria 18.60A.4.3

Serviceable items repaired using correct principles, tools, equipment and procedures

Assessor guide: observe that –

The serviceable item(s) are repaired using appropriate tools and equipment in accordance with specifications and standard operating procedures

Assessor guide: confirm that –

The correct maintenance procedures for serviceable item(s) can be identified
The tools and equipment required to undertake maintenance on the serviceable item(s) can be identified
The specifications of the serviceable item(s) can be identified

Criteria 18.60A.4.4

Repaired and replaceable items reassembled using appropriate tools, equipment, techniques and procedures

Assessor guide: observe that –

Repaired and/or replacement items are assembled in accordance with standard operating procedures

Assessor guide: confirm that –

The procedures for assembling repaired and/or replacement items can be identified

Element 18.60A.5 Calibrate and adjust control instrumentation**Criteria 18.60A.5.1**

Calibrate and adjust panel mounted, split architecture single loop/multiple loop control instruments using correct calibration principles, equipment and methods for all devices according to manufacturers' instructions

Assessor guide: observe that –

The appropriate test and calibration equipment is set up in accordance with standard operating procedures
Control system components are calibrated and adjusted in accordance with standard operating procedures

Assessor guide: confirm that –

The calibration procedures for the control system components can be identified The equipment necessary to calibrate the control system components can be identified The specifications of the equipment to be calibrated can be identified The reasons for selecting the chosen test and calibration equipment can be explained The adjustments that can be made to control system components can be identified The effects of those adjustments on the calibration of the control system component can be explained

Criteria 18.60A.5.2

Adjust controller modes and actions according to specifications

Assessor guide: observe that –

The controller modes and actions are set and adjusted to specification in accordance with standard operating procedures

Assessor guide: confirm that –

The controller modes and actions specified can be identified

Criteria 18.60A.5.3

Zero span and range checks undertaken using correct and appropriate configuration

Assessor guide: observe that –

The control instrumentation is checked for correct zero, span and range in accordance with specifications and standard operating procedures

Assessor guide: confirm that –

The control instrumentation specifications can be identified The procedures for checking control instruments for zero, span and range can be given

Criteria 18.60A.5.4

Correct and appropriate procedures, techniques, tools and equipment used to make final adjustments to control instrumentation to specifications

Assessor guide: observe that –

The control system is adjusted as required to ensure that all components conform to specification in accordance with standard operating procedures

Assessor guide: confirm that –

The procedures for making final adjustments to ensure all control system components conform to specification can be given

Element 18.60A.6 Complete service reports and recommission**Criteria 18.60A.6.1**

Service reports completed to standard operating procedures

Assessor guide: observe that –

All necessary reports are completed in accordance with standard operating procedures

Assessor guide: confirm that –

The reporting/recording requirements associated with the commissioning of the control system can be identified

Criteria 18.60A.6.2

Appropriate follow up procedures adopted

Assessor guide: observe that –

The appropriate follow up procedures are followed

Assessor guide: confirm that –

The follow up actions to be undertaken can be identified The procedures to be followed after maintaining/repairing control system instrumentation can be identified

Criteria 18.60A.6.3

Control instrumentation recommissioned to standard operating procedures

Assessor guide: observe that –

The control system is commissioned in accordance with standard operating procedures

Assessor guide: confirm that –

The procedures for commissioning the control system can be identified

Range statement

Work undertaken autonomously or in a team environment, using predetermined standards of quality, safety and workshop procedures. Tasks undertaken in workshop or on-site environments utilising pneumatic calibrators, electronic calibrators and test equipment (current, voltage and digital). Extends to the use of pneumatic analog and digital test equipment for the testing and calibration of panel mounted, split architecture single loop/multi-loop control instrumentation including PLCs, distributed control systems, computer based systems, both PC based and (mini) process computer based. The tasks involve the use of operating and calibration principles for all devices according to manufacturers' instructions; interpretation of pneumatic electrical and electronic circuit diagrams, interpretation of software configuration data for digital control systems. Included is the basic adjustment of controller modes, checking of loop operation from the controller response to set point and manual output changes; identification and fault finding of simple and multiple controller type control schemes, adjusting controller modes and actions according to specifications. In this unit, major components can include transducers, power supplies, removable circuit boards, sensor units and other like components. Where fault finding is required to electronic component level Unit 18.56A (Diagnose and repair analog equipment and components) and/or Unit 18.65A (Diagnose and repair digital equipment and components) should also be selected.

Evidence**Assessment context**

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the maintenance and repair of control system instrumentation or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 18.61B A Maintain/calibrate complex control systems

Band – Specialisation band B

Field – Maintenance & diagnostics

Unit Weight 8

Notes - Where diagnosis and repair of electronic equipment is undertaken to component level Unit 18.56A (Diagnose and repair analog equipment and components) and/or Unit 18.65A (Diagnose and repair digital equipment and components) should be selected.

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices

5.1A Manual soldering/desoldering - electrical/electronic components

9.1A Draw and interpret sketch

9.2A Interpret technical drawing

12.4A Precision electrical/electronic measurement

18.1A Use hand tools

18.2A Use power tools/hand held operations

18.36B Maintain and repair scientific analysis equipment

18.54A Fault find, test, calibrate instrumentation systems, equipment

18.55A Dismantle, replace and assemble engineering components

18.57A Maintain/service analog/digital electronic equipment

18.62A Install, maintain and calibrate instrumentation sensors, transmitters and final control elements

18.69B Maintain, repair instrumentation process control analysers

Pre-requisite units - Path 2

2.5C11 Measure with graduated devices

9.1A Draw and interpret sketch

9.2A Interpret technical drawing

12.2A Electrical/electronic measurement

18.1A Use hand tools

18.2A Use power tools/hand held operations

18.36B Maintain and repair scientific analysis equipment

18.54A Fault find, test, calibrate instrumentation systems, equipment

18.55A Dismantle, replace and assemble engineering components

18.64A Maintain instrumentation system components

18.69B Maintain, repair instrumentation process control analysers

Pre-requisite units - Path 3

2.5C11 Measure with graduated devices

5.1A Manual soldering/desoldering - electrical/electronic components

9.1A Draw and interpret sketch

9.2A Interpret technical drawing

12.4A Precision electrical/electronic measurement

18.1A Use hand tools

18.2A Use power tools/hand held operations

18.54A Fault find, test, calibrate instrumentation systems, equipment

18.55A Dismantle, replace and assemble engineering components

18.57A Maintain/service analog/digital electronic equipment

18.60A Maintain, repair control instrumentation - single & multiple loop control systems

18.62A Install, maintain and calibrate instrumentation sensors, transmitters and final control elements

18.67A Tune control loops - multi controller or multi element systems

Pre-requisite units - Path 4

2.5C11 Measure with graduated devices

12.2A Electrical/electronic measurement

18.54A Fault find, test, calibrate instrumentation systems, equipment

18.62A Install, maintain and calibrate instrumentation sensors, transmitters and final control elements

9.1A Draw and interpret sketch

18.1A Use hand tools

18.55A Dismantle, replace and assemble engineering components

18.64A Maintain instrumentation system components

9.2A Interpret technical drawing

18.2A Use power tools/hand held operations

18.60A Maintain, repair control instrumentation - single & multiple loop control systems

18.67A Tune control loops - multi controller or multi element systems

Element 18.61B.1 Determine system specifications and control loop characteristics**Criteria 18.61B.1.1**

Engineering specifications, technical information and historical records and trends examined and relevant data documented.

Assessor guide: observe that –

All relevant engineering specifications, technical information, historical records and documents are obtained in accordance with workplace procedures.

Assessor guide: confirm that –

Relevant data on the control loop characteristics can be identified. Where appropriate, trends are identified from the data.

Criteria 18.61B.1.2

System specifications and operational data including those for multiple loop control systems and devices obtained, read and interpreted.

Assessor guide: observe that –

The specifications of system components and operational data are obtained in accordance with workplace procedures.

Assessor guide: confirm that –

The specification of each system component can be identified. Where appropriate, trends are identified from operational data.

Criteria 18.61B.1.3

Circuit and logic diagrams and configuration data obtained, read and interpreted.

Assessor guide: observe that –

All relevant circuit and logic diagrams and configuration data are obtained in accordance with work place procedures.

Assessor guide: confirm that –

The system components and their function can be identified.

Criteria 18.61B.1.4

Consultation with system operators and other relevant plant personnel is carried out, relevant data extracted and documented by appropriate means.

Assessor guide: observe that –

System operators and other relevant plant personnel are consulted with respect to the control loop characteristics. The information obtained from system operators and other relevant personnel is documented in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for documenting information gained by consultation with personnel can be given. Where appropriate, relevant data and/or trends are identified.

Criteria 18.61B.1.5

Appropriate work clearances obtained for monitoring and testing the system.

Assessor guide: observe that –

All necessary work clearances for the monitoring and testing of the system are obtained in accordance with standard operating procedures.

Assessor guide: confirm that –

The work clearances to be obtained can be identified. The procedures for obtaining work clearances can be given.

Element 18.61B.2 Test, monitor and record system operation**Criteria 18.61B.2.0**

Relevant data collected by appropriate means from all sources including maintenance records, chart recorders, data loggers, fault indicators, error codes, operational symptoms, tests and observation monitoring.

Assessor guide: observe that –

In-built fault indicators and error codes are located/read in accordance with standard operating procedures.

Assessor guide: confirm that –

The errors indicated by in-built devices can be correctly identified. All relevant data from all sources is collected and collated for analysis.

Criteria 18.61B.2.1

System operation observed using knowledge of all individual/multiple element loop device characteristics, controller mode principles, testing, calibration and adjustment methods.

Assessor guide: observe that –

The operation of the system is observed to confirm function/ malfunction of the system and/or its components.

Assessor guide: confirm that –

The reasons for observing the system in operation can be explained. The following can be identified for the given system: - all individual/multiple element loop device characteristics - controller mode principles - testing methods - calibration methods - adjustment methods.

Criteria 18.61B.2.1

Fault detection and diagnostic data analysed against predetermined operational specifications, and conclusions documented.

Assessor guide: observe that –

The collated data is compared with the operational specifications of the control system. The results of the analysis of collated data and any conclusions reached are documented in accordance with standard operating procedures.

Assessor guide: confirm that –

Where appropriate, deviations/ variations from specification can be identified. The probable reasons for any deviations/variations from specification can be given. The procedures for documenting control system tests and analysis can be identified.

Criteria 18.61B.2.2

Appropriate test equipment set up and used correctly.

Assessor guide: observe that –

The appropriate test equipment is set up and used in accordance with standard operating procedures.

Assessor guide: confirm that –

The test equipment to be utilised can be identified. The reasons for selecting the chosen test equipment can be explained. The procedures for using the chosen test equipment can be given.

Criteria 18.61B.2.3

Appropriate tests undertaken using standard operating procedures.

Assessor guide: observe that –

All tests are carried out in accordance with standard operating procedures.

Assessor guide: confirm that –

The test procedures to be followed can be given.

Criteria 18.61B.2.4

Signal transmission test equipment set up and used where applicable.

Assessor guide: observe that –

Where appropriate, the transmission signal is tested using suitable equipment and techniques in accordance with standard operating procedures.

Assessor guide: confirm that –

The equipment necessary to test signal transmissions can be identified. The reasons for selecting the chosen test equipment can be given. The test procedures to be followed can be identified.

Criteria 18.61B.2.5

Adjustment/maintenance needs determined through interpretation and analysis of pneumatic, electrical, electronic, logic diagrams and configuration data for all control system devices.

Assessor guide: observe that –

Assessor guide: confirm that –

The adjustments/maintenance to be carried out can be identified. The reasons for identifying the adjustments/maintenance to be carried out can be explained in terms of test results and control system device logic diagrams and configuration data.

Criteria 18.61B.2.6

Connect appropriate field instrumentation to test system configuration.

Assessor guide: observe that –

Appropriate field instruments are connected to the system in accordance with standard operating procedures.

Assessor guide: confirm that –

Field instrumentation to be used to test system configuration can be identified. The procedures for testing system configuration can be given.

Criteria 18.61B.2.7

Connect field instrumentation for selected control operation, test and monitor performance against specifications.

Assessor guide: observe that –

The operation of selected controls is tested and monitored using field instrumentation in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for testing and monitoring the operation of selected controls can be given.

Criteria 18.61B.2.8

Carry out diagnostics checks to ensure correct operation.

Assessor guide: observe that –

Diagnostic checks are carried out on the system in accordance with standard operating procedures.

Assessor guide: confirm that –

Diagnostic checks to be applied to the system to ensure correct operation of the system can be identified. The reasons for selecting the chosen diagnostic checks can be explained. The procedures for carrying out the diagnostic checks can be given.

Criteria 18.61B.2.9

Fault finding and diagnostic tests undertaken using correct equipment, techniques and procedures to detect faulty control system components or elements.

Assessor guide: observe that –

The operational characteristics of control devices, signal conversion instruments and final control elements are checked for conformance to specification, using appropriate test equipment and techniques in accordance with standard operating procedures. Faults/defects in control system components/elements are correctly identified.

Assessor guide: confirm that –

Fault finding and diagnostic tests to be applied to control devices, signal conversion instruments and final control elements can be identified. The necessary test equipment and techniques can be identified. The procedures for testing control system components/elements can be identified.

Element 18.61B.3 Localise fault condition**Criteria 18.61B.3.1**

System tested to the level necessary to detect and localise fault condition.

Assessor guide: observe that –

The system is tested for continuity/fault in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for testing circuits and control lines can be identified. The hazards associated with testing circuits and control lines can be identified. Where appropriate, the procedures for isolating the control system and its components can be identified.

Criteria 18.61B.3.2

Fault condition localised and verified using appropriate test equipment, principles and processes.

Assessor guide: observe that –

Apparent faults are verified using appropriate test equipment and techniques in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for verifying apparent faults in circuits, control lines and/or control system components can be given. The test equipment and techniques required to verify an apparent fault can be identified.

Criteria 18.61B.3.3

Fault condition analysed, evaluated and corrective action planned.

Assessor guide: observe that –

Where appropriate, the corrective action to be taken is documented showing the sequence of activities to be performed.

Assessor guide: confirm that –

The causes of verified faults can be identified. The action to be taken to return the control system/component to specification can be identified.

Element 18.61B.4 Replace or repair faulty condition**Criteria 18.61B.4.1**

Serviceable items dismantled for repair or replacement using appropriate tools, equipment and procedures according to manufacturers' recommendations.

Assessor guide: observe that –

Serviceable items are marked for repair or replacement in accordance with standard operating procedures. Serviceable items are dismantled/disassembled in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for marking serviceable items for repair or replacement can be identified. The procedures for dismantling/ disassembling items for repair or replacement can be identified.

Criteria 18.61B.4.2

Replaceable items selected from manufacturers' catalogues, spare parts lists, or data sheets.

Assessor guide: observe that –

All relevant manufacturers'/suppliers' catalogues, spare parts lists or data sheets are obtained in accordance with workplace procedures.

Assessor guide: confirm that –

Appropriate replacement parts can be identified.

Criteria 18.61B.4.3

Using manufacturers' handbooks, correct maintenance procedures for serviceable items established.

Assessor guide: observe that –

Assessor guide: confirm that –

The correct maintenance procedures for serviceable item(s) can be identified.

Criteria 18.61B.4.4

Serviceable items repaired using correct maintenance procedures and equipment.

Assessor guide: observe that –

The serviceable item(s) are repaired using appropriate tools and equipment in accordance with specifications and standard operating procedures.

Assessor guide: confirm that –

The tools and equipment required to undertake maintenance on the serviceable item(s) can be identified. The specifications of the serviceable item(s) can be identified.

Criteria 18.61B.4.5

Repaired and replaceable items reassembled using appropriate principles, tools, equipment, techniques and procedures.

Assessor guide: observe that –

Repaired and/or replacement items are assembled in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for assembling repaired and/or replacement items can be identified.

Element 18.61B.5 Calibrate, configure, adjust complex control systems

Criteria 18.61B.5.0

Carry out diagnostic checks to ensure correct operation of system taking appropriate corrective action as necessary.

Assessor guide: observe that –

Diagnostic checks of the system are carried out in accordance with standard operating procedures. Where appropriate, corrective action is taken to bring system operation into line with specifications.

Assessor guide: confirm that –

The diagnostic checks to be carried out can be identified. The procedures for carrying out diagnostic checks can be given. The procedures for adjusting the system to conform to operational specifications can be given.

Criteria 18.61B.5.1

Correct calibration and test equipment selected/set up to enable calibration to manufacturers' specifications.

Assessor guide: observe that –

The appropriate test and calibration equipment is set up in accordance with standard operating procedures.

Assessor guide: confirm that –

The calibration procedures for the control system components can be identified. The equipment necessary to calibrate the control system components can be identified. The specifications of the equipment to be calibrated can be identified. The reasons for selecting the chosen test and calibration equipment can be explained.

Criteria 18.61B.5.2

Mechanical alignment of control devices undertaken where applicable.

Assessor guide: observe that –

Where appropriate, control devices are aligned to specifications in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for aligning control devices can be identified. The alignment specifications can be identified. The tools and equipment necessary to carry out the alignment of the control devices can be identified.

Criteria 18.61B.5.3

Configure system using appropriate programming tools and techniques.

Assessor guide: observe that –

The system is configured using appropriate programming tools and techniques in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for configuring the system can be given. The programming tools and techniques to be used can be identified.

Criteria 18.61B.5.4

Tune controllers for optimum control and in accordance with specifications.

Assessor guide: observe that –

Controllers are tuned for optimum performance in accordance with specifications and standard operating procedures.

Assessor guide: confirm that –

The procedures for tuning controllers can be given. The specifications of the controllers can be identified.

Criteria 18.61B.5.5

Correct sequence of tuning is used on multiple control loops and multi-element systems.

Assessor guide: observe that –

Multiple control loops are tuned in the correct sequence in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for tuning multiple control loops and multi-element systems can be given. The correct sequence of tuning can be identified.

Criteria 18.61B.5.6

Correct recording equipment set up for adjustment and monitoring during tuning.

Assessor guide: observe that –

The appropriate recording equipment is set up and monitored during the tuning process to identify the effects of adjustment made to the system.

Assessor guide: confirm that –

The procedures for recording signals and data during system tuning operations can be given. The recording equipment to be used can be identified.

Criteria 18.61B.5.7

Calibration and adjustment function performed on multi-loop devices, multi-element control loops, controller modes and actions according to operational specifications using correct principles and methods applicable to the type of control loop being serviced.

Assessor guide: observe that –

Control system components are calibrated and adjusted in accordance with standard operating procedures.

Assessor guide: confirm that –

The adjustments that can be made to control system components can be identified. The effects of those adjustments on the calibration of the control system components can be explained.

Criteria 18.61B.5.8

Make on-line changes to parameters in the system to meet specified requirements.

Assessor guide: observe that –

Where appropriate, system parameters are changed on-line to meet specified requirements.

Assessor guide: confirm that –

The requirements to be achieved by changing system parameters on-line can be identified. The procedures for changing parameters can be given.

Criteria 18.61B.5.9

Connect field instrumentation for selected control operation and operate system to a satisfactory level of control.

Assessor guide: observe that –

Field instrumentation is connected to a selected control system. The system is operated to a satisfactory level of control.

Assessor guide: confirm that –

The level of control to be achieved can be identified. The procedures for operating and monitoring a control system can be given.

Element 18.61B.6 Return system to service**Criteria 18.61B.6.1**

Final adjustments to align system operation to operational specifications including process and optimum control efficiencies undertaken.

Assessor guide: observe that –

The control system is adjusted as required to ensure that all components conform to specifications in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for making final adjustments to ensure all control system components conform to specifications can be given.

Criteria 18.61B.6.2

Correct procedures are applied in return to service including configuring, calibrating, adjusting, tuning and final validation of system performance in accordance with specifications.

Assessor guide: observe that –

All instrumentation is correctly configured, calibrated, adjusted and tuned in accordance with specifications and standard operating procedures.

Assessor guide: confirm that –

The procedures for returning to service all instrumentation in the control system can be identified.

Criteria 18.61B.6.3

System returned to service in accordance with standard operating procedures.

Assessor guide: observe that –

The system performance in conformance to specifications is validated using appropriate equipment and techniques in accordance with standard operating procedures. The control system is returned to service in accordance with standard operating procedures.

Assessor guide: confirm that –

The equipment and techniques to be used to adjust, tune and validate system performance can be identified. The procedures for returning to service can be identified.

Criteria 18.61B.6.4

Service reports completed to standard operating procedures.

Assessor guide: observe that –

All necessary reports are completed in accordance with standard operating procedures.

Assessor guide: confirm that –

The reporting/recording requirements associated with return to service of control systems can be identified.

Range statement

Work undertaken autonomously or in a team environment in consultation with appropriate personnel, using predetermined standards of quality, safety and workshop procedures. Tasks undertaken in workshop or on-site environments. Equipment used may include pneumatic and/or electronic, analog and/or digital test and recording equipment. Control systems include pneumatic control, analog and/or digital electronics, distributed PLC, DCS, SCADA, and computer based control systems. Computer based control systems may include supervisory mode. Control strategies include; ratio, cascade, selector, duplex, feed forward, adaptive, dynamic compensations, computations, energy management and environmental control/systems. Tasks include testing, configuration and calibration of multiple loop control systems. Tasks involve the interpretation of manuals, specifications and diagrams, including pneumatic, electrical, electronic and logic diagrams, as well as program listings and configuration data for control system devices. Unit 5.2A (High reliability soldering and desoldering) must also be selected if soldering of components is required to advanced or military specifications, where the reliability of electrical connections is critical, or where surface mounted devices are being soldered/de-soldered.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the maintenance and repair of complex control systems or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 18.62A A Install, maintain and calibrate instrumentation sensors, transmitters and final control elements

Band – Specialisation band A

Field – Maintenance & diagnostics

Unit Weight 8

Notes - This unit has dual status and is to be regarded as both a Specialisation band A unit and Specialisation band B unit for progression to C7 (AQF level IV)

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices

5.1A Manual soldering/desoldering - electrical/electronic components

9.1A Draw and interpret sketch

9.2A Interpret technical drawing

12.4A Precision electrical/electronic measurement

18.1A Use hand tools

18.2A Use power tools/hand held operations

18.54A Fault find, test, calibrate instrumentation systems, equipment

18.55A Dismantle, replace and assemble engineering components

18.57A Maintain/service analog/digital electronic equipment

Pre-requisite units - Path 2

2.5C11 Measure with graduated devices

9.1A Draw and interpret sketch

9.2A Interpret technical drawing

12.2A Electrical/electronic measurement

18.1A Use hand tools

18.2A Use power tools/hand held operations

18.54A Fault find, test, calibrate instrumentation systems, equipment

18.55A Dismantle, replace and assemble engineering components

18.64A Maintain instrumentation system components

Element 18.62A.1 Select for installation appropriate sensors, transmitters and final control elements

Criteria 18.62A.1.1

Determine specification requirements from data sheets, circuit diagrams, engineering drawings.

Assessor guide: observe that –

All relevant data sheets, circuit diagrams, engineering drawings, instructions etc. are obtained in accordance with workplace procedures.

Assessor guide: confirm that –

The specifications for the sensors, transmitters and final control elements to be installed can be identified.

Criteria 18.62A.1.2

Using knowledge of device characteristics and principles of operation, specification requirements interpreted, defined and understood.

Assessor guide: observe that –

Assessor guide: confirm that –

The characteristics and principles of operation of the sensors, transmitters and final control elements to be installed can be correctly described.

Criteria 18.62A.1.3

Having regard for measurement range, processes and environment, sensors, transmitters and final control elements are selected according to their device characteristics, principles of operation and measurement capabilities, in conformance to specifications.

Assessor guide: observe that –

Appropriate sensors, transmitters and final control elements are selected in accordance with specifications and standard operating procedures.

Assessor guide: confirm that –

The procedures for selecting appropriate sensors, transmitters and final control elements can be given. The following details with respect to the sensors, transmitters and final control elements to be selected can be identified: - the range of measurements to be made - the processes to be measured - the environment in which measurements are to be taken - the capabilities of the selected sensor, transmitter and final control elements. The reasons for selecting the chosen sensors, transmitters and final control elements can be explained.

Element 18.62A.2 Install instrumentation sensors, transmitters and final control elements**Criteria 18.62A.2.1**

Sensors, transmitters and final control elements installed using sound working knowledge of installation principles, procedures, techniques, tools and equipment, according to appropriate codes of practice, standards, safety and legislative requirements.

Assessor guide: observe that –

Sensors, transmitters and final control elements are correctly installed to specification using appropriate tools, equipment and techniques in accordance with all relevant codes, standards, legislative and safety requirements and procedures.

Assessor guide: confirm that –

The procedures for installing sensors, transmitters and final control elements can be given. The tools, equipment and techniques required to install sensors and transmitters can be identified. The relevant codes, standards, safety and legislative requirements can be identified.

Criteria 18.62A.2.2

During installation access for maintenance and mounting connections for power, signal, and process are planned and catered for.

Assessor guide: observe that –

Appropriate access is provided to the installed sensors, transmitters and final control elements to enable future maintenance and connections to be undertaken.

Assessor guide: confirm that –

The need to provide access to installed sensors, transmitters and final control elements for future maintenance and connections can be explained. The maintenance, removal/ replacement procedures applicable to sensors, transmitters and final control elements can be identified. The connections to be made to sensors, transmitters and final control elements can be identified.

Criteria 18.62A.2.3

Installed sensors, transmitters and final control elements diagnosed for correct operation using appropriate equipment and procedures. Results assessed against specifications or manufacturers technical data sheets.

Assessor guide: observe that –

The installed sensors, transmitters and final control elements are tested for correct operation using appropriate test equipment and techniques in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for testing installed sensors, transmitters and final control elements can be given. The test equipment and techniques to be used to check installed sensors, transmitters and final control elements for correct operation can be identified. The specifications of the installed sensors, transmitters and final control elements can be identified. Where appropriate, variations of test results from specifications can be identified.

Element 18.62A.3 Maintain, diagnose sensors , transmitters and final control elements**Criteria 18.62A.3.1**

Using knowledge of device characteristics and principles of operation, preventative maintenance schedules and procedures are applied to maintain sensors, transmitters and final control elements in optimum condition.

Assessor guide: observe that –

Relevant preventative maintenance schedules for sensors, transmitters and final control elements are obtained in accordance with work place procedures. Scheduled/preventative maintenance is carried out on sensors, transmitters and final control elements in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for maintaining sensors, transmitters and final control elements can be identified. The maintenance to be undertaken and the frequency at which sensors, transmitters and final control elements are to be maintained can be identified.

Criteria 18.62A.3.2

Using knowledge of device characteristics and principles of operation, sensing elements cleaned and serviced to maintain optimum operating condition particularly at the process interface, using correct principles, tools, equipment, techniques and procedures.

Assessor guide: observe that –

Sensors are cleaned and serviced using appropriate tools, techniques and equipment in accordance with standard operating procedures.

Assessor guide: confirm that –

The housekeeping requirements with respect to sensors can be identified. The reasons for cleaning and servicing sensors can be explained. The tools, equipment and techniques required to clean and service sensors can be identified. The procedures for cleaning and servicing sensors can be identified.

Criteria 18.62A.3.3

Using appropriate test equipment and procedures, sensors, transmitters and final control elements are diagnosed, within the system or as individual devices, to determine correct operation or malfunction.

Assessor guide: observe that –

The correct function/malfunction of sensors, transmitters and final control elements is determined using appropriate test equipment and techniques in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for determining correct function/malfunction of sensors, transmitters and final control elements can be given. The test equipment and techniques required to determine correct function or malfunction of sensors, transmitters and final control elements can be identified.

Criteria 18.62A.3.4

Operation of sensors, transmitters and final control elements monitored and assessed against predetermined specification or manufacturers technical data.

Assessor guide: observe that –

The test results are recorded in accordance with standard operating procedures.

Assessor guide: confirm that –

The operational specifications of the sensors, transmitters and final control elements can be identified. Where appropriate, variations of sensors, transmitters and final control elements from specification can be identified. The procedures for recording test results can be identified.

Criteria 18.62A.3.5

Using appropriate test equipment/procedures correct operation of sensors, transmitters and final control elements is checked or fault condition identified, localised and monitored.

Assessor guide: observe that –

Where appropriate, the apparent fault is monitored in accordance with standard operating procedures. Where appropriate, faults in sensors, transmitters and final control elements are identified and localised in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for monitoring apparent faults detected from test results can be given. The test results have been compared to the sensors, transmitters and final control elements specification. Any variations between test results and specifications can be identified. The probable causes of variations between test results and specifications can be explained.

Element 18.62A.4 Complete fault documentation and plan corrective action**Criteria 18.62A.4.1**

Faults and malfunctions documented or reported according to standard operating procedures.

Assessor guide: observe that –

Faults and malfunctions in sensors, transmitters and final control elements are reported/ recorded in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for reporting/ recording faults and/or malfunctions in sensors, transmitters and final control elements can be identified.

Criteria 18.62A.4.2

Corrective action planned autonomously or in consultation with appropriate personnel and actioned.

Assessor guide: observe that –

An appropriate, sequential action plan to correct faults in sensors, transmitters and final control elements is prepared.

Assessor guide: confirm that –

The action to be taken to return the sensors, transmitters and final control elements to specification can be given. The reasons for undertaking the proposed actions can be explained. Where appropriate, the persons to be consulted in planning the corrective action can be identified. The sequence of actions to be taken can be given.

Element 18.62A.5 Analyse control loop and localise faults**Criteria 18.62A.5.1**

Engineering specifications and technical information, control device, signal transmission and final element specifications obtained and interpreted. System specifications, including operational data, and historical records and trends read and interpreted.

Assessor guide: observe that –

All relevant and appropriate specifications and information obtained and/or accessed.

Assessor guide: confirm that –

There is a clear understanding and interpretation of all specifications and information.

Criteria 18.62A.5.2

Consultation with system operators and other relevant plant personnel is carried out, relevant data extracted and documented to standard operating procedures.

Assessor guide: observe that –

Appropriate communication occurs and relevant details recorded.

Assessor guide: confirm that –

The reasons and importance for consultation can be explained.

Criteria 18.62A.5.3

Operation of the system is observed using sound knowledge of all external control device characteristics, controller modes, signal transmission, final control devices.

Assessor guide: observe that –

Systematic observation occurs.

Assessor guide: confirm that –

<p>Criteria 18.62A.5.4 Correct and appropriate signal transmission test equipment set up and applied using appropriate technique.</p>	<p><i>Assessor guide: observe that –</i> Correct equipment for the job is selected and properly set up and applied.</p>	<p><i>Assessor guide: confirm that –</i> The factors that determine the type of test equipment required can be given.</p>
<p>Criteria 18.62A.5.5 Circuits and control lines tested to the level necessary to detect and localise fault.</p>	<p><i>Assessor guide: observe that –</i> Appropriate and thorough sequential and loop testing procedures are used.</p>	<p><i>Assessor guide: confirm that –</i> The need for systematic and sequential testing can be explained.</p>
<p>Element 18.62A.6 Repair/replace, overhaul sensors, transmitters and final control elements</p>		
<p>Criteria 18.62A.6.1 Sensors, transmitters and final control elements examined and verified for replacement, repair or overhaul using correct tools/equipment and appropriate principles, techniques and procedures.</p>	<p><i>Assessor guide: observe that –</i> Sensors, transmitters and final control elements are checked using appropriate tools, techniques and equipment and marked for replacement, repair or overhaul in accordance with standard operating procedures.</p>	<p><i>Assessor guide: confirm that –</i> The procedures for marking components for repair, replacement or overhaul can be identified. The tools, equipment and techniques required to test components can be identified. The reasons for marking components for repair, replacement and/or overhaul can be explained.</p>
<p>Criteria 18.62A.6.2 Replacement items selected from manufacturers parts lists or catalogues to meet specifications.</p>	<p><i>Assessor guide: observe that –</i> All relevant supplier catalogues are obtained in accordance with work place procedures.</p>	<p><i>Assessor guide: confirm that –</i> The specifications of the component(s) to be replaced can be identified. Appropriate replacement components can be identified from supplier catalogues.</p>
<p>Criteria 18.62A.6.3 Replacement items obtained.</p>	<p><i>Assessor guide: observe that –</i> Where appropriate, replacement components are obtained in accordance with standard operating procedures.</p>	<p><i>Assessor guide: confirm that –</i> The procedures for obtaining replacement parts can be identified.</p>

Criteria 18.62A.6.4

Faulty items repaired or overhauled using correct principles, techniques, tools, equipment and procedures.

Assessor guide: observe that –

Faulty items are repaired or overhauled using appropriate tools, techniques and equipment in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for repairing/over-hauling faulty items can be identified. The tools, techniques and equipment required to repair/over-haul the faulty items can be identified.

Criteria 18.62A.6.5

Repaired, overhauled and replacement items prepared for refitting according to standard workshop procedures.

Assessor guide: observe that –

The repaired, overhauled and replacement items are prepared for fitting/refitting in accordance with standard operating procedures.

Assessor guide: confirm that –

The preparation requirements of items to be fitted/refitted can be identified. The procedures for preparing items for fitting/refitting can be given.

Criteria 18.62A.6.6

Sensors, transmitters and final control elements refitted using correct principles, tools, equipment and procedures.

Assessor guide: observe that –

Sensors, transmitters and final control elements are fitted/refitted using appropriate tools, techniques and equipment in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for fitting/refitting sensors, transmitters and final control elements can be given. The tools, techniques and equipment required to fit/refit sensors, transmitters and final control elements can be identified.

Criteria 18.62A.6.7

Refitted sensors, transmitters and final control elements prepared for testing and calibration.

Assessor guide: observe that –

The fitted/refitted sensors, transmitters and final control elements are prepared for testing and calibration in accordance with standard operating procedures.

Assessor guide: confirm that –

The preparation requirements of sensors, transmitters and final control elements prior to testing and calibration can be identified.

Element 18.62A.7 Calibrate and test instrumentation sensors, transmitters and final control elements**Criteria 18.62A.7.1**

Sensors, transmitters and final control elements calibrated against appropriate physical standards using correct calibration devices, equipment, techniques and procedures.

Assessor guide: observe that –

Sensors, transmitters and final control elements are calibrated against appropriate physical standards using appropriate calibration devices, equipment and techniques in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for calibrating sensors, transmitters and final control elements can be identified. The physical standards against which sensors, transmitters and final control elements are to be calibrated can be identified. The devices, equipment and techniques required to calibrate sensors, transmitters and final control elements can be identified.

Criteria 18.62A.7.2

Zero, span and range tests performed using correct calibration devices, equipment, principles, techniques and procedures.

Assessor guide: observe that –

The sensors, transmitters and final control elements are tested with respect to zero, span and range using appropriate equipment and techniques in accordance with standard operating procedures.

Assessor guide: confirm that –

The zero, span and range tests to be applied to the sensors, transmitters and final control elements can be identified.

Criteria 18.62A.7.3

Zero span and range results assessed against manufacturers instructions sheets.

Assessor guide: observe that –

Relevant instruction/information sheets are accessed and used.

Assessor guide: confirm that –

Specification range for the sensors, transmitters and final control elements can be identified. The test results have been compared to the specifications and any deviations/variations from specification can be identified. The probable causes of any deviations/variations from specification detected can be explained.

Criteria 18.62A.7.4

Zero, span adjustments applied to align sensors, transmitters and final control elements to manufacturers instruction sheets using correct calibration equipment, principles, techniques and procedures.

Assessor guide: observe that –

Sensors, transmitters and final control elements are adjusted to specification in accordance with standard operating procedures.

Assessor guide: confirm that –

The adjustments that can be made to sensors, transmitters and final control elements with respect to zero, span and range can be identified. The procedures for adjusting sensors, transmitters and final control elements can be identified.

Element 18.62A.8 Return sensors, transmitters and final control elements and control loops to service**Criteria 18.62A.8.1**

Sensors, transmitters and final control elements put into service on conformance to specifications with due regard to process requirements, safety, installation/commissioning procedures and sequence of operation.

Assessor guide: observe that –

Sensors, transmitters and final control elements are returned to service in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for recommissioning sensors, transmitters and final control elements can be given. The safety procedures to be taken when recommissioning sensors, transmitters and final control elements can be explained.

Criteria 18.62A.8.2 Controller modes and actions adjusted according to specifications.	<i>Assessor guide: observe that –</i> Device performance requirements are considered during adjustment.	<i>Assessor guide: confirm that –</i> The performance requirements can be given.
Criteria 18.62A.8.3 Electrical and pneumatic transmission lines tested and appropriate action taken including the use of signal conditioning devices.	<i>Assessor guide: observe that –</i> Accepted test procedures are used and that any necessary action is undertaken where required.	<i>Assessor guide: confirm that –</i> Variation to test procedures to suit different operating conditions and parameters can be described.
Criteria 18.62A.8.4 Correct procedures are applied in returning instrumentation to service, including configuring, calibrating, adjusting, tuning and validating system performance.	<i>Assessor guide: observe that –</i> All actions are carried out systematically and to identified procedures.	<i>Assessor guide: confirm that –</i> Variation from given specifications can be analysed and correct action sequence determined.
Criteria 18.62A.8.5 System returned to service in accordance with standard operating procedures.	<i>Assessor guide: observe that –</i> Procedures are followed to ensure correct operation once returned to service.	<i>Assessor guide: confirm that –</i>

Range statement

Work undertaken autonomously or in a team environment, using predetermined standards of quality, safety and workshop procedures. Tasks relate to the use of mechanical, pneumatic, electrical, electronic (analog and digital) and associated sensing, indication and signal transmitting instrumentation, representing measurement of pressure, temperature, level, flowrate, weight, density and other process variables. Equipment includes manometers, dead weight testers, vacuum system, power supplies, control valve test beds. Pneumatic, analogue, digital, test and calibration equipment, utilised for maintenance, calibration and testing of process signal converters and final control elements. Tasks involve the maintenance, calibration and testing of process signal converters, associated devices, calibration of transmitters to manufacturers' specifications and application requirements (including flow, level, temperature, pressure), installation and zero checking of transmitters, testing of electrical and pneumatic signal lines. Additional tasks include the maintenance of control valves (including changing and reseating valve plugs), adjustment of valve actuators (pneumatic, electrical and hydraulic) maintenance and adjustment of pneumatic, electro-pneumatic and electronic valve positioners and signal converters. Tasks undertaken in workshop, laboratory or on-site environments utilising mechanical and electrical tools and test equipment such as: spanners (all forms), screwdriver, pliers, multimeters (analog, digital) calibration devices/charts, manufacturers parts lists, catalogues and instructions sheets. Extends to the installation, maintenance, testing, calibration and commissioning of sensors and transmitters in accordance to specifications with due regard to process requirements, safety, installation/commissioning principles, techniques and procedures. All codes of practice and legislative requirements adhered to where applicable. Unit 5.2A (High reliability soldering and desoldering) must also be selected if soldering of components is required to advanced or military specifications, where the reliability of electrical connections is critical, or where surface mounted devices are being soldered/de-soldered. If diagnosis and repair of electronic equipment is undertaken to component level Unit 18.56A (Diagnose and repair analog equipment and components) and/or Unit 18.65A (Diagnose and repair digital equipment and components) should be selected.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the installation, repair and overhaul of instrumentation sensors, transmitters and final control elements or other units requiring the exercise of the skills and knowledge covered by this unit.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures.

Unit MEM 18.63A A Terminate signal and data cables

Band – Specialisation band A

Field – Maintenance & diagnostics

Unit Weight 4

Pre-requisite units - Path 1

5.1A Manual soldering/desoldering - electrical/electronic components

9.1A Draw and interpret sketch

9.2A Interpret technical drawing

12.2A Electrical/electronic measurement

18.1A Use hand tools

Element 18.63A.1 Identify and mark conductors/cables

Criteria 18.63A.1.1

Cables and conductors are identified using appropriate test equipment and techniques.

Assessor guide: observe that –

Cables and conductors are identified using appropriate test techniques and equipment in accordance with standard operating procedures.

Assessor guide: confirm that –

The test equipment and techniques to be used to identify cables and conductors can be given. The procedures to be followed when identifying cables and conductors can be given.

Criteria 18.63A.1.2

Cables and conductors are labelled in accordance with standard operating procedures to specifications.

Assessor guide: observe that –

All cables and conductors are labelled in accordance with specifications and standard operating procedures.

Assessor guide: confirm that –

The labelling requirements of cables and conductors can be identified. The procedures for labelling cables and conductors can be given.

Element 18.63A.2 Prepare cable

Criteria 18.63A.2.1

Termination requirements and specifications obtained and understood.

Assessor guide: observe that –

All relevant instructions, specifications and data sheets are obtained in accordance with standard operating procedures.

Assessor guide: confirm that –

The termination requirements and specifications can be identified.

Criteria 18.63A.2.2

Cable ends prepared to specifications utilising appropriate tools and techniques.

Assessor guide: observe that –

Cable ends are prepared for termination in accordance with specifications and standard operating procedures.

Assessor guide: confirm that –

The procedures for preparing cable ends for termination can be given. The tools and techniques to be used to prepare cable ends for termination can be given.

Element 18.63A.3 Terminate cables**Criteria 18.63A.3.1**

Cables are terminated to specifications utilising appropriate tools and techniques.

Assessor guide: observe that –

All terminations are made to specifications in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for terminating cables can be given. The tools and techniques to be used to terminate cables can be identified.

Criteria 18.63A.3.2

Terminations are tested/examined for compliance with specifications utilising appropriate test equipment and techniques.

Assessor guide: observe that –

Completed terminations are tested for compliance to specifications safely in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for testing completed terminations can be given. The tests to be undertaken can be identified.

Element 18.63A.4 Fix/secure cables**Criteria 18.63A.4.1**

Cables are fixed/secured in accordance with standard operating procedures and specifications, utilising appropriate fixing/securing techniques.

Assessor guide: observe that –

All cables are fixed/secured in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for fixing and securing cables can be given. A variety of fixing/securing techniques can be identified. The reasons for selecting the chosen fixing/securing technique can be given.

Range statement

Work undertaken autonomously or as part of team environment. Work undertaken in field or workshop environment. Termination techniques may include solder, crimp, wire wrap, (non-insulated and pre-insulated), connectors, multi-terminal plugs and sockets, fibre optics, co-axial, terminal blocks etc. Fixing and securing include the use of clamps, cable ties, bolting, screwing etc. All specifications and procedures are obtained from circuit drawings, data sheets and instructions. All work and work practices undertaken to regulatory and legislative requirements. If termination of cables is undertaken to pre-determined specifications and procedures the competency is covered by Unit 3.4A (Electronic/electrical assembly (production)). Where hand held power tools are used, Unit 18.2A (Use power tool/hand held operations). Where higher levels of electrical/electronic measures are required, Unit 12.4A (Precision electrical/electronic measurement) should be selected. This unit covers all types of signal and data cables, excluding specialist cables.

Types of cables covered include:

Signal cables;

- thermocouple/compensator cables
- transmission cables
- thermoplastic/elastomer insulated/sheathed
- compensating cables

Communication cables;

- telephone
- category 5
- coaxial
- optical fibre

Extra low voltage power and control cables;

- telephone
- category 5
- optical fibre
- thermoplastic/elastomer insulated/sheathed

For termination and connection of specialist cables, see Unit 10.11A (Terminate and connect specialist cables).

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team.

The assessment environment should not disadvantage the candidate.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the termination of signal and data cables or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 18.64A A Maintain instrumentation system components

Band – Specialisation band A

Field – Maintenance & diagnostics

Unit Weight 6

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices

18.1A Use hand tools

9.1A Draw and interpret sketch

18.2A Use power tools/hand held operations

12.2A Electrical/electronic measurement

18.55A Dismantle, replace and assemble engineering components

Pre-requisite units - Path 2

2.5C11 Measure with graduated devices

18.1A Use hand tools

9.2A Interpret technical drawing

18.2A Use power tools/hand held operations

12.2A Electrical/electronic measurement

18.55A Dismantle, replace and assemble engineering components

Element 18.64A.1 Check instrumentation system components

Criteria 18.64A.1.1

System components identified correctly.

Assessor guide: observe that –

Appropriate system components are located.

Assessor guide: confirm that –

Various system components can be identified.

Criteria 18.64A.1.2

The characteristics and operational function of each system component are understood.

Assessor guide: observe that –

Assessor guide: confirm that –

The characteristics and operational function of each system component can be explained.

Criteria 18.64A.1.3

The operational function of each component is inspected and tested in accordance with standard operating procedures.

Assessor guide: observe that –

A range of instrumentation system components is inspected and tested. Standard operating procedures are followed.

Assessor guide: confirm that –

Procedures for inspecting & testing instrumentation system components can be explained.
The equipment required to test instrumentation system components can be identified.

Criteria 18.64A.1.4

Operation of each component is assessed against specifications.

Assessor guide: observe that –

All relevant data sheets and specifications are obtained and used to interpret operation of component in accordance with standard operating procedures. Instrumentation components not operating in accordance with specifications are identified.

Assessor guide: confirm that –

The specifications of each instrumentation system component can be identified. Deviations from specifications can be explained.

Element 18.64A.2 Identify, repair/replace faulty instrumentation system components**Criteria 18.64A.2.1**

Faulty system components are localised/isolated and the malfunction confirmed by inspection & testing using instrumentation principles, procedures and safety requirements.

Assessor guide: observe that –

All relevant instrumentation circuits, drawings, instructions, manuals and data sheets are obtained and used in accordance with workplace procedures. The individual components within the instrumentation system are checked for correct operation in accordance with standard operating procedures.

Assessor guide: confirm that –

The individual components within the instrumentation system can be identified. The safety procedures to be followed when working on instrumentation components can be identified. Where appropriate, faulty system components can be identified.

Criteria 18.64A.2.2

Faulty system components are dismantled and repaired according to manufacturer's/site specifications and in accordance with standard operating procedures.

Assessor guide: observe that –

Components are dismantled and repaired correctly.

Assessor guide: confirm that –

The procedures for repairing instrumentation system components can be explained.

Criteria 18.64A.2.3

Replacement parts are selected from manufacturer catalogues and listings according to required specifications.

Assessor guide: observe that –

Correct replacement parts are selected from the manufacturer/supplier catalogues.

Assessor guide: confirm that –

Parts to be replaced can be identified. The reasons for replacing parts can be given.

Criteria 18.64A.2.4

System components are reassembled and tested for correct operation and assessment against specifications and in accordance with standard operating procedures.

Assessor guide: observe that –

Instrumentation system components are reassembled correctly. Operation and conformance to specifications is confirmed.

Assessor guide: confirm that –

Reassembly and testing techniques are understood.

Criteria 18.64A.2.5

Correct operation of the instrumentation system is confirmed to according to standard operating procedure.

Assessor guide: observe that –

The operation of the instrumentation system is checked for conformance to specification in accordance with standard operating procedures.

Assessor guide: confirm that –

The correct operation of the instrumentation system can be explained. Procedures for checking instrumentation can be given.

Criteria 18.64A.2.6

Appropriate follow up procedures are adopted according to standard operating procedures.

Assessor guide: observe that –

Where appropriate, repaired/replaced instrumentation system components are checked for correct operation in accordance with standard follow up procedures.

Assessor guide: confirm that –

Follow up procedures can be explained.

Criteria 18.64A.2.7

Where appropriate, service reports are completed according to standard operating procedures.

Assessor guide: observe that –

Service reports are completed with all relevant detail.

Assessor guide: confirm that –

Reporting/recording procedures can be explained. Reasons for completing service reports can be explained.

Range statement

Work undertaken using predetermined standards of safety, quality and work procedures. Instrumentation system components identified, inspected and assessed using instrumentation principles to predetermined specifications interpreted from data sheets and circuit diagrams. Repairs and replacements to site or manufacturer's specifications. Instrumentation system components may include sensors, transmitters, converters, indicators, analysers and controllers associated with determining/controlling density, level, flow, temperature, composition etc, of a range of materials. Application may include, but are not limited to, fixed and mobile plant and equipment, marine installations and machine and process operations. Correct operational function of equipment components confirmed and commissioned in conformance to specifications, using standard operating procedures. For straightforward removals/replacement of components from an instrumentation system, see Unit 18.55A (Dismantle, replace and assemble engineering components).

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the maintenance of instrumentation system components or other units requiring the exercise of skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 18.65A A Diagnose and repair digital equipment and components

Band – Specialisation band A

Field – Maintenance & diagnostics

Unit Weight 10

Notes - This unit has dual status and is to be regarded as both a Specialisation band A unit and Specialisation band B unit for progression to C7 (AQF level IV)

Pre-requisite units - Path 1

5.1A Manual soldering/desoldering - electrical/electronic components

9.2A Interpret technical drawing

12.4A Precision electrical/electronic measurement

18.1A Use hand tools

18.57A Maintain/service analog/digital electronic equipment

Element 18.65A.1 Locate fault

Criteria 18.65A.1.1

System/equipment functions and principles determined and understood by reference to equipment manuals, circuit diagrams etc.

Assessor guide: observe that –

All relevant circuit diagrams, manuals, specifications, schematics, maintenance records, etc obtained in accordance with work place procedures.

Assessor guide: confirm that –

The function(s) of the electronic system/equipment can be identified. The electronic principles utilised in the operation of the system/equipment can be explained.

Criteria 18.65A.1.2

Built in test functions run and fault indicators error codes and appropriate maintenance records checked and reviewed.

Assessor guide: observe that –

Where appropriate, built-in test functions are run in accordance with standard operating procedures. Where appropriate, built-in fault indicators are located and read/recorded in accordance with standard operating procedures. Where appropriate, error code interpretation documents are obtained in accordance with work place procedures.

Assessor guide: confirm that –

The procedures for running built-in test functions can be identified. Errors indicated by built-in devices can be correctly identified.

Criteria 18.65A.1.3

Fault symptoms reproduced where appropriate and verified, using appropriate technique.

Assessor guide: observe that –

Where appropriate, the fault symptoms are reproduced in the system and the fault verified using appropriate test equipment and techniques in accordance with standard operating procedures.

Assessor guide: confirm that –

The symptoms of the fault in the electronic system/equipment can be identified. The purpose of reproducing system/equipment fault symptoms can be explained. The test equipment and techniques necessary to confirm electronic system/equipment faults can be identified. The procedures for verifying faults in electronic system/equipment can be given.

Criteria 18.65A.1.4

Where appropriate, faulty equipment isolated and removed from system using correct and appropriate tools and techniques.

Assessor guide: observe that –

Where appropriate, the electronic system/equipment is isolated from the power supply in accordance with standard operating procedures. Where appropriate the faulty equipment is removed from the electronic system using appropriate tools and techniques in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for isolating electronic systems/equipment can be identified. The hazards associated with electronic systems/equipment can be identified. The procedures for removing equipment from electronic systems can be given. The tools and techniques to be used to remove the equipment from the electronic system can be identified.

Criteria 18.65A.1.5

Equipment checked and tested using correct and appropriate test equipment and techniques.

Assessor guide: observe that –

The electronic equipment is checked for conformance to specification using appropriate equipment and techniques in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for testing faulty equipment can be given. The operational specifications of the equipment can be identified. The equipment and techniques to be used to test the faulty equipment can be identified. The test results obtained are compared with the operational specifications and the faulty components identified. The probable causes of component failure can be given.

Criteria 18.65A.1.6

Faulty component/s identified and/or fault cause isolated.

Assessor guide: observe that –

Assessor guide: confirm that –

The test results obtained are compared with the operational specifications and the faulty components identified. The probable causes of component failure can be given.

Element 18.65A.2 Repair/replace faulty components**Criteria 18.65A.2.1**

Faulty component removed where required using correct and appropriate tools and techniques.

Assessor guide: observe that –

Where appropriate, faulty components are removed from the electronic system using appropriate tools and techniques in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for removing faulty components from electronic systems can be identified. The tools and techniques to be used to remove components from electronic systems can be identified.

Criteria 18.65A.2.2

Faulty component repaired/replaced in accordance with manufacturers recommended procedures or to standard operating procedures.

Assessor guide: observe that –

All relevant suppliers' catalogues are obtained in accordance with work place procedures. Faulty components are repaired/ replaced using appropriate tools and equipment in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for repairing faulty components can be identified. Replacement parts can be selected from suppliers' catalogues in conformance to specification. All tools and equipment necessary to repair faulty components can be identified.

Criteria 18.65A.2.3

Repaired/replacement components fitted in accordance with manufacturers recommended procedure or to standard operating procedure using correct and appropriate tools and techniques.

Assessor guide: observe that –

The repaired/replaced components are refitted into the equipment using appropriate tools and techniques in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for fitting repaired/ replaced components into the equipment can be identified. The tools and techniques required to refit the repaired/replaced components into the equipment can be identified.

Criteria 18.65A.2.4

Where appropriate, repaired equipment refitted to system using correct and appropriate tools and techniques.

Assessor guide: observe that –

Where appropriate, the repaired equipment is refitted into the electronic system using appropriate tools and techniques in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for fitting repaired equipment into electronic systems can be identified.

Criteria 18.65A.2.5

Systems/equipment checked and tested for correct operational compliance to specifications utilising correct and appropriate test procedures and equipment.

Assessor guide: observe that –

The electronic system/equipment is tested for compliance with specifications using appropriate test equipment and techniques, in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for testing electronic system/equipment performance can be identified. The operational specifications of the electronic system/equipment can be identified. The test equipment and techniques necessary to check electronic system/equipment performance can be identified.

Range statement

Work undertaken autonomously or in team environment using predetermined standards of quality, safety and work procedures. Diagnose includes working from first principles to identify non-routine and undefined faults. Work performed in laboratory, workshops or on site environments. Correct and appropriate tool and equipment includes continuity testers, ammeters, voltmeters, cathode ray oscilloscopes, frequency counters, signal generators, digital probes, pulse generators, hand tools and soldering and desoldering devices etc. Fault finding techniques include signal injection, substitution, monitoring, heating/cooling etc. Electronic sub assemblies can form part of electronic systems or equipment including computer, control, safeguarding, monitoring, telecommunications, interface or security equipment etc. Components may include discrete component assemblies or individual components such as resistors, digital/electronic switching devices, capacitors, etc. All specifications and procedures gained from circuit drawings, engineering data sheets or manufacturers hand books. All schematics, flow charts, work and work practices undertaken to regulatory and legislative requirements. Unit 5.2A (High reliability soldering and desoldering) must also be selected if soldering of components is required to advanced or military specifications, where the reliability of electrical connections is critical, or where surface mounted devices are being soldered/de-soldered. Where termination of cables is involved Unit 10.2A (Terminate and connect electrical wiring) and/or Unit 18.63A (Terminate signal and data cables) must also be selected.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the diagnosis and repair of digital systems and equipment or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 18.66A A Diagnose and repair microprocessor based equipment

Band – Specialisation band A

Field – Maintenance & diagnostics

Unit Weight 6

Notes - This unit has dual status and is to be regarded as both a Specialisation band A unit and Specialisation band B unit for progression to C5 (AQF level V)

Pre-requisite units - Path 1

5.1A Manual soldering/desoldering - electrical/electronic components

9.1A Draw and interpret sketch

9.2A Interpret technical drawing

12.4A Precision electrical/electronic measurement

18.1A Use hand tools

18.57A Maintain/service analog/digital electronic equipment

18.65A Diagnose and repair digital equipment and components

Element 18.66A.1 Locate faults

Criteria 18.66A.1.1

Equipment function and principles determined and understood by reference to schematics, circuit diagrams, flow charts, equipment manuals etc.

Assessor guide: observe that –

All relevant circuit diagrams, manuals, specifications, flow charts, schematics, maintenance records, etc obtained in accordance with work place procedures.

Assessor guide: confirm that –

The function(s) of the microprocessor-based equipment can be identified. The electronic principles utilised in the operation of the equipment can be explained.

Criteria 18.66A.1.2

Built in test functions run and results interpreted correctly.

Assessor guide: observe that –

Where appropriate, built-in test functions are run in accordance with standard operating procedures. Where appropriate, built-in fault indicators are located and read/recorded in accordance with standard operating procedures. Where appropriate, error code interpretation documents are obtained in accordance with work place procedures.

Assessor guide: confirm that –

The procedures for running built-in test functions can be identified. Errors indicated by built-in devices can be correctly identified.

Criteria 18.66A.1.3

Fault symptoms reproduced where appropriate and verified using appropriate techniques.

Assessor guide: observe that –

Where appropriate, the fault symptoms are reproduced in the system and the fault verified using appropriate test equipment and techniques in accordance with standard operating procedures.

Assessor guide: confirm that –

The symptoms of the fault in the microprocessor-based equipment can be identified. The purpose of reproducing fault symptoms can be explained. The test equipment and techniques necessary to confirm microprocessor-based equipment faults can be identified. The procedures for verifying faults in microprocessor-based equipment can be given.

Criteria 18.66A.1.4

Faulty or defect component/s identified and/or fault cause isolated.

Assessor guide: observe that –

The microprocessor-based equipment is checked for conformance to specification using appropriate equipment and techniques in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for testing faulty microprocessor-based equipment can be given. The operational specifications of the equipment can be identified. The equipment and techniques to be used to test the faulty microprocessor-based equipment can be identified. The test results obtained are compared with the operational specifications and the faulty components identified. The probable causes of component failure can be given.

Element 18.66A.2 Replace/repair faulty components**Criteria 18.66A.2.1**

Faulty component renewed using correct and appropriate tools and techniques.

Assessor guide: observe that –

Where appropriate, faulty components are removed from the microprocessor-based equipment using appropriate tools and techniques in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for removing faulty components from microprocessor-based equipment can be identified. The tools and techniques to be used to remove components from microprocessor-based equipment can be identified.

Criteria 18.66A.2.2

Faulty component/s repaired/replaced in accordance with manufacturers recommended procedure or standard operating procedure.

Assessor guide: observe that –

All relevant suppliers' catalogues are obtained in accordance with work place procedures. Faulty components are repaired/ replaced using appropriate tools and equipment in accordance with standard operating procedures.

Assessor guide: confirm that –

The reasons for identifying the faulty component for repair or replacement can be given. The procedures for repairing faulty components can be identified. Replacement parts can be selected from suppliers' catalogues in conformance to specification. All tools and equipment necessary to repair faulty components can be identified.

Criteria 18.66A.2.3

Repaired/replaced component/s fitted using correct and appropriate tools and techniques.

Assessor guide: observe that –

The repaired/replaced components are refitted into the microprocessor-based equipment using appropriate tools and techniques in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for fitting repaired/ replaced components into the microprocessor-based equipment can be identified. The tools and techniques required to refit the repaired/replaced components into the microprocessor-based equipment can be identified.

Criteria 18.66A.2.4

Equipment checked and tested for operational compliance to specifications utilising correct and appropriate test procedures and equipment.

Assessor guide: observe that –

The microprocessor-based equipment is tested for compliance with specifications using appropriate test equipment and techniques, in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for testing microprocessor-based equipment performance can be identified. The operational specifications of the microprocessor-based equipment can be identified. The test equipment and techniques necessary to check the microprocessor-based equipment performance can be identified.

Range statement

This unit refers to situations in which the individual has sufficient information and access to microprocessor components to diagnose the functioning of elements within the microprocessor. For routine fault finding within microprocessor systems refer to Unit 18.57A (Maintain/service analog/digital electronic equipment). For diagnosis of analog components Unit 18.56A (Diagnose and repair analog equipment and components) should also be selected. Work undertaken autonomously or in a team environment. Work performed in workshop/laboratory or on site environments. Correct and appropriate tools and equipment includes voltmeters, cathode ray oscilloscope, frequency counters, pulse generators, digital probes etc. Fault finding techniques include signal injection, substitution, monitoring, heating/cooling and the use of inbuilt software and hardware diagnostics. Equipment includes sub assemblies of systems or discrete equipment used in computer, control, safeguarding, monitoring, telecommunication, connection, security etc equipment and systems. Components may include component assemblies (PCB), etc. or individual components including resistors, capacitors and full range of plug in and solder fixed chips associated with microprocessor equipment. This unit requires understanding of machine and assembly language and address and bus systems. All specifications and procedures gained from schematics, circuit drawings, instruction sets, flow charts and data sheets. All work and work practices to regulatory or legislative requirements.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the diagnosis and repair of microprocessor-based equipment or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 18.67A A Tune control loops - multi controller or multi element systems

Band – Specialisation band A

Field – Maintenance & diagnostics

Unit Weight 6

Notes - This unit has dual status and is to be regarded as both a Specialisation band A unit and Specialisation band B unit for progression to C5 (AQF level V)

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices

5.1A Manual soldering/desoldering - electrical/electronic components

9.1A Draw and interpret sketch

9.2A Interpret technical drawing

12.4A Precision electrical/electronic measurement

18.1A Use hand tools

18.2A Use power tools/hand held operations

18.54A Fault find, test, calibrate instrumentation systems, equipment

18.55A Dismantle, replace and assemble engineering components

18.57A Maintain/service analog/digital electronic equipment

18.60A Maintain, repair control instrumentation - single & multiple loop control systems

18.62A Install, maintain and calibrate instrumentation sensors, transmitters and final control elements

Pre-requisite units - Path 2

2.5C11 Measure with graduated devices

9.1A Draw and interpret sketch

9.2A Interpret technical drawing

12.2A Electrical/electronic measurement

18.1A Use hand tools

18.2A Use power tools/hand held operations

18.54A Fault find, test, calibrate instrumentation systems, equipment

18.55A Dismantle, replace and assemble engineering components

18.60A Maintain, repair control instrumentation - single & multiple loop control systems

18.62A Install, maintain and calibrate instrumentation sensors, transmitters and final control elements

18.64A Maintain instrumentation system components

Element 18.67A.1 Determine control loop characteristics

Criteria 18.67A.1.1

Engineering specifications, technical information and historical process, records and trends examined for relevant data.

Assessor guide: observe that –

All relevant engineering specifications, technical information, historical records and documents are obtained in accordance with work place procedures. The specifications of system components and operational data is obtained in accordance with work place procedures.

Assessor guide: confirm that –

Relevant data on the control loop characteristics can be identified. Where appropriate, trends are identified from the data. The specifications of each system component can be identified.

Criteria 18.67A.1.2

Consultation with system operators and other relevant plant personnel is carried out, relevant data extracted and documented to standard operating procedures.

Assessor guide: observe that –

System operators and other relevant plant personnel are consulted with respect to the control loop characteristics. The information obtained from system operators and other relevant personnel is documented in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for documenting information gained by consultation with personnel can be given. Where appropriate, relevant data and/or trends are identified.

Criteria 18.67A.1.3

Programmed maintenance/service reports read and relevant data noted.

Assessor guide: observe that –

Relevant maintenance and service reports are obtained in accordance with work place procedures.

Assessor guide: confirm that –

Where appropriate, relevant data and/or trends are identified.

Criteria 18.67A.1.4

Data is analysed and control loop characteristics ascertained.

Assessor guide: observe that –

Assessor guide: confirm that –

The data collected and collated is compared to the operational specifications of the control loop. The control loop characteristics can be identified.

Element 18.67A.2 Record control loop responses**Criteria 18.67A.2.1**

Using chart recorders and data loggers, control loop responses are recorded in open and closed loop mode.

Assessor guide: observe that –

The operational responses of the control loop are recorded in accordance with standard operating procedures.

Assessor guide: confirm that –

The operational responses to be monitored can be identified. The procedures for recording test and operational data can be identified.

Criteria 18.67A.2.2

Unit tested for tuning using appropriate diagnostic techniques.

Assessor guide: observe that –

Appropriate diagnostic techniques and procedures are used throughout the monitoring and testing process.

Assessor guide: confirm that –

The need to employ appropriate fault-finding and diagnostic techniques throughout the monitoring and testing process can be explained. The test equipment and techniques required to diagnose control loop responses can be identified. The procedures for diagnosing and fault-finding control loops can be given.

Criteria 18.67A.2.3

Diagnostic results analysed against specifications.

Assessor guide: observe that –

The collated data is compared with the operational specifications of the control system. The results of the analysis of collated data and any conclusions reached are documented in accordance with standard operating procedures.

Assessor guide: confirm that –

Where appropriate, deviations/ variations from specification can be identified. The probable reasons for any deviations/variations from specification can be given. The procedures for documenting control system tests and analysis can be identified.

Element 18.67A.3 Tune control loops**Criteria 18.67A.3.1**

Using knowledge of control loop device characteristics, controller mode principles and adjustment methods, tuning operations performed using correct and appropriate techniques, procedures and equipment.

Assessor guide: observe that –

The control loop is tuned using appropriate equipment and techniques in accordance with standard operating procedures.

Assessor guide: confirm that –

The modes of controller operation can be identified. The methods of adjusting the controller can be given. The procedures for tuning the control loop can be identified. The equipment and techniques required to tune the control loop can be identified.

Criteria 18.67A.3.2

Correct and appropriate test and recording equipment used for monitoring and adjustment of control loop components during controller tuning operations.

Assessor guide: observe that –

The results of tests and adjustments carried out on control loop components during the tuning of the controller are recorded using appropriate equipment in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for recording test results can be given. The recording equipment to be used to monitor adjustments made to control loop components can be identified.

Criteria 18.67A.3.3

Step response - open loop tuning calculations are applied to achieve specified loop characteristics.

Assessor guide: observe that –

Specified loop characteristics are correctly calculated.

Assessor guide: confirm that –

The loop characteristics that may be calculated can be identified. The procedures for calculating loop characteristics can be explained. The data necessary to enable loop characteristics to be calculated can be identified. The procedures for obtaining the data necessary for calculating loop characteristics can be given.

Criteria 18.67A.3.4

Closed loop tuning methods using ultimate sensitivity and systematic trials, used to achieve specified loop characteristics.

Assessor guide: observe that –

Specified loop characteristics are achieved through the correct use of closed loop tuning methods.

Assessor guide: confirm that –

The closed loop tuning methods can be identified. The loop characteristics to be obtained from closed loop tuning methods can be identified. The procedures for obtaining loop characteristics from closed loop tuning methods can be given.

Criteria 18.67A.3.5

Correct sequence of tuning is used on multi controllers and/or multi element systems to achieve specified characteristics.

Assessor guide: observe that –

The specified loop characteristics of multi controller and/or multi element systems are achieved by the application of correctly sequenced tuning procedures.

Assessor guide: confirm that –

The specified sequence of events within the control loop can be identified. The procedures for tuning multi controller and/or multi element systems can be given.

Criteria 18.67A.3.6

Tune control loops to optimum mode settings utilising correct and appropriate techniques, tools, equipment and procedures.

Assessor guide: observe that –

The control loop is tuned to specification in each operational mode using appropriate tools, techniques and equipment in accordance with standard operating procedures.

Assessor guide: confirm that –

The optimum mode settings for the control loop can be identified. The tools, equipment and techniques required to tune the control loop can be identified. The procedures for tuning control loops can be given.

Element 18.67A.4 Complete service reports**Criteria 18.67A.4.1**

Service reports completed to standard operating procedures.

Assessor guide: observe that –

All necessary reports are completed in accordance with standard operating procedures.

Assessor guide: confirm that –

The reporting/recording requirements associated with the commissioning of the process control loop can be identified.

Criteria 18.67A.4.2

Appropriate follow up procedures adopted.

Assessor guide: observe that –

The appropriate follow-up procedures are followed.

Assessor guide: confirm that –

The follow-up actions to be undertaken can be identified. The procedures to be followed after tuning the process control loop can be identified.

Criteria 18.67A.4.3

Process control loop recommissioned to specifications.

Assessor guide: observe that –

The process control loop is commissioned in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for commissioning the process control loop can be identified.

Range statement

Work undertaken autonomously or in a team environment using predetermined standards of quality, safety and workshop procedures. Tasks undertaken in situ, utilising appropriate knowledge of control loop characteristics, controller mode principles and methods of adjustment and tuning. Involves the use of pneumatic, analog and digital electronic test and recording equipment for the monitoring and adjustment of control loop tuning - the recording of control loop responses in open and closed loop modes. Included is the application of step response - open loop tuning calculations and closed loop, ultimate, sensitivity trials to achieve specified loop characteristics in conformance to operational specifications. Consultation with process operation personnel for data collection and to ensure plant safety during tuning operations. Extends to the interpretation of process system configuration data, including process schematics and instrument schematics. Correct sequencing of tuning of multi control loops and multi element systems is included. The application of fault finding, diagnostic and analytical techniques is included. All work and work practices undertaken to regulatory and legislative requirements. Where fault finding is required to electronic component level Unit 18.56A (Diagnose and repair analog equipment and components) should also be selected.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the tuning of control loops or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 18.69B A Maintain, repair instrumentation process control analysers

Band – Specialisation band B

Field – Maintenance & diagnostics

Unit Weight 6

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices

9.2A Interpret technical drawing

18.2A Use power tools/hand held operations

18.57A Maintain/service analog/digital electronic equipment

5.1A Manual soldering/desoldering - electrical/electronic components

12.4A Precision electrical/electronic measurement

18.54A Fault find, test, calibrate instrumentation systems, equipment

18.62A Install, maintain and calibrate instrumentation sensors, transmitters and final control elements

9.1A Draw and interpret sketch

18.1A Use hand tools

18.55A Dismantle, replace and assemble engineering components

Pre-requisite units - Path 2

2.5C11 Measure with graduated devices

12.2A Electrical/electronic measurement

18.54A Fault find, test, calibrate instrumentation systems, equipment

9.1A Draw and interpret sketch

18.1A Use hand tools

18.55A Dismantle, replace and assemble engineering components

9.2A Interpret technical drawing

18.2A Use power tools/hand held operations

18.64A Maintain instrumentation system components

Element 18.69B.1 Perform preventative maintenance on process control analysers

Criteria 18.69B.1.1

Determine specification requirements from manufacturers' manuals, maintenance schedules and other relevant documents.

Assessor guide: observe that –

All relevant data sheets, circuit diagrams, engineering drawings, instructions etc. are obtained in accordance with workplace procedures.

Assessor guide: confirm that –

The specifications for the process control analyser to be installed can be identified.

Criteria 18.69B.1.2

Using knowledge of process control analyser characteristics and principles of operation, specification requirements interpreted, defined and understood.

Assessor guide: observe that –

Assessor guide: confirm that –

Criteria 18.69B.1.3

Preventative maintenance schedules performed on process control analysers to service and maintain analysers at optimum operating condition.

Assessor guide: observe that –

Relevant preventative maintenance schedules for process control analysers are obtained in accordance with workplace procedures. Scheduled/preventative maintenance is carried out on process control analysers in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for maintaining process control analysers can be identified. The maintenance to be undertaken and the frequency at which process control analysers are to be maintained can be identified.

Criteria 18.69B.1.4

Using appropriate electrical and electronic test equipment, techniques and procedures, specified process control analysers are diagnosed within the system or within the laboratory to determine correct operation or malfunction.

Assessor guide: observe that –

The correct function or the malfunction of process control analysers is determined using appropriate test equipment and techniques in accordance with standard operating procedures. The test results are recorded in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for determining correct function or the malfunction of process control analysers can be given. The test equipment and techniques required to determine correct function or malfunction of process control analysers can be identified. The operational specifications for the process control analysers can be identified. The procedures for recording test results can be identified.

Criteria 18.69B.1.5

Operation of process control analysers monitored and assessed against predetermined laboratory data and/or fault condition identified, localised and monitored.

Assessor guide: observe that –

Where appropriate, the apparent fault is monitored in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for monitoring apparent faults detected from test results can be given.

Criteria 18.69B.1.6

Using appropriate test equipment and procedures, correct operation of analysers is tested, and/or fault condition identified, localised and monitored.

Assessor guide: observe that –

Where appropriate, faults in process control analysers are identified and localised in accordance with standard operating procedures.

Assessor guide: confirm that –

The test results have been compared with the process control analyser's specification. Any variations between test results and specifications can be identified. The probable causes of variations between test results and specifications can be explained.

Criteria 18.69B.1.7

Correct operation confirmed.

Assessor guide: observe that –

Where appropriate, correct action of the process control analysers is confirmed.

Assessor guide: confirm that –

Criteria 18.69B.1.8

Faults and malfunctions identified and confirmed.

Assessor guide: observe that –

Where appropriate, faults and malfunctions are identified and confirmed.

Assessor guide: confirm that –

Element 18.69B.2 Complete fault documentation**Criteria 18.69B.2.1**

Faults and malfunctions documented or reported according to standard operating procedures.

Assessor guide: observe that –

Faults and malfunctions in process control analysers are reported/ recorded in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for reporting/ recording faults and/or malfunctions in process control analysers can be identified.

Element 18.69B.3 Plan corrective action**Criteria 18.69B.3.1**

Corrective action planned autonomously or in consultation with appropriate personnel and actioned.

Assessor guide: observe that –

An appropriate, sequential action plan to correct faults in process control analysers is prepared.

Assessor guide: confirm that –

The action to be taken to return the process control analysers to specification can be given. The reasons for undertaking the proposed actions can be explained. Where appropriate, the persons to be consulted in planning the corrective action can be identified. The sequence of actions to be taken can be given.

Element 18.69B.4 Repair, replace, overhaul process control analysers**Criteria 18.69B.4.1**

Process control analysers examined or verified for repair, replacement or overhaul using correct tools/equipment and appropriate principles, techniques and procedures.

Assessor guide: observe that –

Process control analysers are checked using appropriate tools, techniques and equipment and marked for replacement, repair or overhaul in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for marking components for repair, replacement or overhaul can be identified. The tools, equipment and techniques required to test components can be identified. The reasons for marking components for repair, replacement and/or overhaul can be explained.

Criteria 18.69B.4.2

Replacement items selected from manufacturers' parts lists or catalogues according to specifications required.

Assessor guide: observe that –

All relevant supplier catalogues are obtained in accordance with work place procedures.

Assessor guide: confirm that –

The specifications for the component(s) to be replaced can be identified. Appropriate replacement components can be identified from supplier catalogues.

Criteria 18.69B.4.3

Faulty items repaired or overhauled using correct principles, techniques, tools, equipment and procedures.

Assessor guide: observe that –

Faulty items are repaired or overhauled using appropriate tools, techniques and equipment in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for repairing/overhauling faulty items can be identified. The tools, techniques and equipment required to repair/overhaul the faulty items can be identified.

Criteria 18.69B.4.4

Repaired, overhauled and replacement items prepared for refitting according to standard operating procedures.

Assessor guide: observe that –

The repaired, overhauled and replacement items are prepared for fitting/refitting in accordance with standard operating procedures.

Assessor guide: confirm that –

The preparation requirements of items to be fitted/refitted can be identified. The procedures for preparing items for fitting/refitting can be given.

Criteria 18.69B.4.5

Process control analysers refitted using correct principles, tools, equipment and procedures.

Assessor guide: observe that –

Process control analysers are fitted/ refitted using appropriate tools, techniques and equipment in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for fitting/refitting process control analysers can be given. The tools, techniques and equipment required to fit/refit process control analysers can be identified.

Criteria 18.69B.4.6

Refitted process control analysers prepared for testing and calibration.

Assessor guide: observe that –

The fitted/refitted process control analysers are prepared for testing and calibration in accordance with standard operating procedures.

Assessor guide: confirm that –

The preparation requirements of process control analysers prior to testing and calibration can be identified.

Element 18.69B.5 Calibrate and test process control analysers

Criteria 18.69B.5.1

Process control analysers calibrated against appropriate physical standards using correct calibration devices, equipment, techniques and procedures.

Assessor guide: observe that –

Process control analysers are calibrated against appropriate physical standards using appropriate calibration devices, equipment and techniques in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for calibrating process control analysers can be identified. The physical standards against which process control analysers are to be calibrated can be identified. The devices, equipment and techniques required to calibrate process control analysers can be identified.

Criteria 18.69B.5.2

Calibrated process control analysers tested using appropriate test equipment.

Assessor guide: observe that –

Calibrated process control analysers are tested using appropriate equipment in accordance with standard operating procedures.

Assessor guide: confirm that –

The equipment necessary to test calibrated process control analysers can be identified. The procedures for testing calibrated process control analysers can be given.

Criteria 18.69B.5.3

Calibration and analysis data collected.

Assessor guide: observe that –

All relevant calibration and analysis data with respect to the given process controller is obtained in accordance with work place procedures.

Assessor guide: confirm that –

Assessor guide: confirm that –

The collected and collated data has been compared with the operational specifications of the process control analyser and any deviations/ variations from specification identified.

Criteria 18.69B.5.4

Calibration and analysis data interpreted and understood.

Assessor guide: observe that –

Criteria 18.69B.5.5

Calibration and analysis data assessed in accordance with manufacturers' data sheets, codes of practice and safety procedures.

Assessor guide: observe that –

Assessor guide: confirm that –

The probable causes of any variations/deviations detected can be explained. Where appropriate, action to be taken to return the process control analyser to specification can be identified. The reasons for undertaking the proposed action(s) can be explained.

Element 18.69B.6 Re-install and recommission process control analysers**Criteria 18.69B.6.1**

Process control analysers put into service to specifications with due regard to process requirements, codes of practice, safety, commissioning procedures and techniques.

Assessor guide: observe that –

Process control analysers are recommissioned into service in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for recommissioning process control analysers can be given. The safety precautions to be taken when recommissioning process control analysers can be explained.

Criteria 18.69B.6.2

Service reports completed to standard operating procedure.

Assessor guide: observe that –

All necessary service reports are completed in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for reporting/recording service undertaken on process control analysers can be given. The reasons for recording service undertaken on process control analysers can be given.

Range statement

Work undertaken autonomously or in a team environment, using predetermined standards of quality, safety and workshop procedures. Tasks performed in laboratory, workshop or on-site environments using electrical and electronic test equipment for transmission and signal measurement. Extends to the use of liquid analysis devices for the measurement of pH, selective and specific ions, oxygen and electrolytic conductivity. Included is the use of gas analysis devices operating on the principles of thermal conductivity, thermal reaction, combustion, paramagnetism, chemical absorption, ionisation, infra-red, ultraviolet, emission or absorption and solid electrolytic conductivity. Tasks involve the use of hygrometers, wet and dry bulb and calibration of gas cylinders and gas supply equipment, the use of chemical calibration solutions and the use of special calibration devices specific to chemical detectors. Central to the task is the interpretation of electrical and electronic circuit diagrams and the interpretation of calibration and analysis data and procedures in accordance with manufacturers' data sheets. Safety codes of practice including the identification, handling and appropriate use of high pressure gas cylinders, equipment and chemical solutions are included. Unit 5.2A (High reliability soldering and desoldering) must also be selected if soldering of components is required to advanced or military specifications, where the reliability of electrical connections is critical, or where surface mounted devices are being soldered/de-soldered. If diagnosis and repair of electronic equipment is undertaken to component level Unit 18.56A (Diagnose and repair analog equipment and components) and/or Unit 18.65A (Diagnose and repair digital equipment and components) should be selected.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the maintenance and repair of instrumentation process control analysers or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 18.70B B Modify complex electrical circuits and systems

Band – Specialisation band B

Field – Maintenance & diagnostics

Unit Weight 6

This unit covers the competencies required to check circuits and systems and diagnose faults, modify systems as required and test the modified system. Diagnostic techniques may include testing for voltage, current, frequency, polarity, phase circuit continuity, insulation resistance, earth continuity etc.

Pre-requisite units - Path 1

9.1A Draw and interpret sketch

10.3A Install and test electrical wiring and circuits (up to 1000vAC/1500vDC)

18.1A Use hand tools

18.49A Disconnect/reconnect fixed wired equipment which use up to 1000vAC/1500vDC

9.2A Interpret technical drawing

12.2A Electrical/electronic measurement

18.2A Use power tools/hand held operations

18.51A Fault find repair/rectify complex electrical circuits

10.2A Terminate and connect electrical wiring

12.4A Precision electrical/electronic measurement

18.48A Fault find and repair/rectify basic electrical circuits

Element 18.70B.1 Determine system specifications and characteristics

Criteria 18.70B.1.1

Complex circuit/system function and characteristics determined and understood with reference to circuit diagrams, specifications, schematics and/or consultation with technical adviser

Assessor guide: observe that –

Relevant circuit diagrams, specifications, schematics, engineering data sheets, etc. are obtained in accordance with work site procedures

Assessor guide: confirm that –

The circuit function and characteristics can be identified
The appropriate personnel to consult for technical advice can be identified

Criteria 18.70B.1.2

System specifications and operational data obtained, read and interpreted

Assessor guide: observe that –

Information and data obtained

Assessor guide: confirm that –

Information and data can be described and interpretation synthesised

Criteria 18.70B.1.3

Findings are verified using correct and appropriate techniques, procedures, tools and test equipment

Assessor guide: observe that –

Circuit/system faults are confirmed/localised using appropriate test equipment, techniques and tools in accordance with work site procedures

Assessor guide: confirm that –

Common electrical test instruments and their application can be identified
Common techniques for testing electrical circuits/systems can be identified

Criteria 18.70B.1.4

Results are recorded and analysed to determine appropriate modification

Assessor guide: observe that –

Faults in the operation of the electrical circuit/system are recorded/reported in accordance with work site procedures

Assessor guide: confirm that –

The recording/reporting requirements for electrical circuit/system faults can be identified
Appropriate circuit/system modification can be identified

Element 18.70B.2 Modify circuits and systems as required**Criteria 18.70B.2.1**

Modifications undertaken as determined to standard operating procedures

Assessor guide: observe that –

Circuit/system modifications undertaken safely in accordance with work site procedures All relevant documentation is amended to reflect the modifications undertaken in accordance with work site procedures

Assessor guide: confirm that –

The hazards associated with the modification to the circuit/system to be undertaken can be identified The relevant regulatory requirements can be identified

Element 18.70B.3 Test modification**Criteria 18.70B.3.1**

Modification tested and monitored to assess suitability

Assessor guide: observe that –

The modified electrical circuit/system is tested and monitored for conformance to specifications in accordance with work site procedures Where appropriate, reports on the suitability of the modifications undertaken are completed in accordance with work site procedures

Assessor guide: confirm that –

The operational specifications of the circuit/system can be identified That appropriate test equipment and its application to the testing of the modified circuit/system can be identified The testing and monitoring procedures for modified circuits and systems can be identified

Criteria 18.70B.3.2

Modifications documented in accordance with standard operating procedures
be identified

Assessor guide: observe that –

Reports completed

Assessor guide: confirm that –

The reporting/recording requirements associated with the modification of complex electrical circuits and systems can

Range statement

A systems' circuit is defined as one that interconnects between a number of interdependent apparatus. A systems' circuit is made up of more than one interconnecting circuit controlling and processing apparatus inputs and outputs. This unit involves demonstration of an understanding of system inter-relationship and dynamics, the implications of modifications to system and the ability to determine appropriate system modifications. Complex electrical circuits and systems cover industrial control systems, automatic process machines, material transfer systems, distribution systems, complex control panels etc. incorporating a range of circuit protective devices, relays, timers, transformers, sensors etc. Work undertaken autonomously or in a team environment using predetermined standards of quality, safety and work procedures. Work performed in situ. Correct and appropriate tools and equipment may include continuity testers, ammeters, voltmeters, multimeters, tong testers, wattmeters, cathode ray oscilloscope, etc. Diagnostic techniques may include testing for voltage, current, frequency, polarity, phase circuit continuity, insulation resistance, earth continuity etc. All specifications and procedures gained from schematics, circuit diagrams/drawings, engineering data sheets or manufacturers' hand books. Modifications are on existing circuits and systems and are limited to replacement of components, changes to supply and circuitry. All modifications recorded or incorporated into drawings, schematics, etc. All work and work practices undertaken to regulatory and legislative requirements where required.

Evidence guide**Assessment context**

This unit should be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units applicable to the safety, quality, communication, materials handling, recording and reporting associated with the diagnosis and modification of complex electrical circuits and systems, or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant data sheets, catalogues, circuit diagrams and engineering drawings. The candidate will be required to: - Orally, or by methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment, the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities.

Unit MEM 18.71A A Connect/disconnect fluid conveying system components

Band – Specialisation band A

Field – Maintenance & diagnostics

Unit Weight 2

Pre-requisite units - Path 1

13.3A Work safely with industrial chemicals and materials 18.1A Use hand tools

Element 18.71A.1 Disconnect fluid conveying components and assemblies

Criteria 18.71A.1.1

Safety/risk assessment is carried out, potentially hazardous situations/conditions identified and safety devices positioned as required.

Assessor guide: observe that –

Plant operator or other appropriate personnel consulted to ensure isolation has been correctly carried out. Potentially hazardous situations are identified and remedial action taken. Tagging, safety/security lock off devices and signage installed using appropriate techniques and procedures.

Assessor guide: confirm that –

Different sources of stored energy and their applications can be described and identified from circuit diagrams and manufacturer manuals. Hazardous situations/conditions can be explained. OHS responsibilities of customer and self can be explained. Safety/security lock off devices and signage can be identified. The reasons for installing lock off devices and signage can be explained. The procedures for installing lock off devices and signage can be given.

Criteria 18.71A.1.2

Fluid conveying conductor lay out is noted, recorded and labelled to standard operating procedures.

Assessor guide: observe that –

Appropriate note is taken of the layout, if necessary for future reference.

Assessor guide: confirm that –

Procedures to record and label components are understood.

Criteria 18.71A.1.3

Faulty component/assembly identified using specific trouble-shooting procedures and reference documents to identify the fault location.

Assessor guide: observe that –

Faulty component is located.

Assessor guide: confirm that –

Trouble shooting techniques understood.

Criteria 18.71A.1.4

Fluid conveying components and assemblies disconnected and removed using appropriate techniques, procedures, tools and equipment.

Assessor guide: observe that –

Pressures neutralised safely. Component/assembly removed correctly. Safety practices adhered to.

Assessor guide: confirm that –

Techniques, procedures and safety practices understood, including neutralisation of pressures.

Criteria 18.71A.1.5

Open system adequately sealed with standard or special purpose sealing materials.

Assessor guide: observe that –

System is sealed correctly.

Assessor guide: confirm that –

Standard & specific sealing materials and techniques are understood.

Element 18.71A.2 Obtain replacement parts**Criteria 18.71A.2.1**

Replacement parts selected from manufacturer catalogues and other relevant reference sources according to international standards and specifications.

Assessor guide: observe that –

Reference materials are used to identify required part(s)

Assessor guide: confirm that –

Different fluid conveying parts and their function can be explained.

Element 18.71A.3 Test and store components**Criteria 18.71A.3.1**

Fluid conveying assemblies and individual components pressure tested according to industry and manufacturer standards.

Assessor guide: observe that –

Correct pressure testing method is followed and safety practices adhered to at all times.

Assessor guide: confirm that –

Techniques and safety practices for pressure testing are understood.

Basic functions of fluid power systems understood, including:

- effects of heat/contamination
- pressures, flow rates and temperatures
- hose strength and size
- effect of media on hoses
- test, operational and burst pressures

Criteria 18.71A.3.2

Condition assessed and noted according to standard operating procedure.

Assessor guide: observe that –

Correct assessment of condition and serviceability is made.

Assessor guide: confirm that –

Criteria for assessment are understood. Storage methods and requirements can be explained.

Criteria 18.71A.3.3

Components/assemblies cleaned, sealed and stored according to industry and manufacturer standards.

Assessor guide: observe that –

Components cleaned, sealed and stored correctly.

Assessor guide: confirm that –

Methods of cleaning, sealing and storing are

Element 18.71A.4 Connect fluid conveying components and assemblies**Criteria 18.71A.4.1**

Connections are checked and prepared for reconnection.

Assessor guide: observe that –

Suitability of connection is established.

Assessor guide: confirm that –

Criteria for checking connection is understood.

Criteria 18.71A.4.2

Components and assemblies are connected to equipment to specifications using appropriate techniques.

Assessor guide: observe that –

Connections are established correctly.

Assessor guide: confirm that –

Techniques for connection are understood.

Criteria 18.71A.4.3

Tagged out equipment, signage and safety blocking devices removed according to standard operating procedures.

Assessor guide: observe that –

All signage & security devices are removed.

Assessor guide: confirm that –

Procedure for removal is understood.

Criteria 18.71A.4.4

Equipment and fluid conveying systems checked and tested for correct operation according to manufacturer and industry standards.

Assessor guide: observe that –

Test is carried out correctly.

Assessor guide: confirm that –

Testing procedures are understood. Safety requirements can be explained.

Element 18.71A.5 Report results**Criteria 18.71A.5.1**

Reporting and certification procedures followed.

Assessor guide: observe that –

Reports completed correctly.

Assessor guide: confirm that –

Reporting procedures and media for reporting are understood.

Criteria 18.71A.5.2

All relevant information is completed and correct.

Assessor guide: observe that –

All relevant information is included and checked.

Assessor guide: confirm that –

Required information is understood.

Range statement

Work undertaken using pre-determined standards of safety, quality and work procedures. Fluid conveying components and assemblies identified, inspected and assessed using fluid power principles or pre-determined specific interpretations from data and circuit diagrams. Repairs and replacement to pressure and suction systems on fixed and mobile plant/equipment, including marine, heavy plant, manufacturing plant applications. Work undertaken to industry standards and manufacturer specifications. Fluid conveying components may include high pressure seals, seats, hoses, tubes, pipes, fittings, connectors, adaptors and anchors, and other associated attachments. System applications may include, but are not limited to hydraulic, pneumatic, water, gas, acids/corrosives/alkalines, abrasives, petroleum and other dry/wet media. System pressures would typically range from 10.5MPa to 35 MPa, ranging up to 70 MPa. Functional testing of fluid conveying components and assemblies may include in-situ and high pressure test rigs. Reference material for identification of parts may include manufacturer product catalogues, tables and charts. This unit is not to be selected when Unit 18.55A (Dismantle, replace and assemble engineering components) or Unit 18.52A (Maintain and repair fluid power systems for mobile plant) has already been selected.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with fluid conveying systems or other competencies requiring the exercise of the skills and knowledge covered by this unit.

accepted engineering techniques, practices, processes and workplace procedures. Tasks

To undertake the elements of this competency an understanding of basic concepts of fluid power and fluid power components and their application to fluid conveying systems is required. This is considered important for the ability to work safely on systems containing stored energy devices (accumulators) and systems under pressure due to external forces.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 18.72A A Manufacture fluid conveying conductor assemblies

Band – Specialisation band A

Field – Maintenance & diagnostics

Unit Weight 4

Pre-requisite units - Path 1

18.1A Use hand tools

Element 18.72A.1 Manufacture fluid conveying system conductors

Criteria 18.72A.1.1

Conductor requirements identified and appropriate materials/fittings selected to suit application.

Assessor guide: observe that –

Correct materials/fittings are obtained with reference to circuit drawings, schematics, reference manuals and equipment specifications.

Assessor guide: confirm that –

Conductor materials and fittings for a range of applications and media (fluid types) are understood.

Criteria 18.72A.1.2

Conductor materials prepared for assembly.

Assessor guide: observe that –

Existing conductor prepared and fittings removed, if necessary. Conductor is cut to required length using appropriate equipment. Pipes bent to basic shapes to drawing or by copying supplied shapes. Correct fittings are detected to suit conductors or machined to size, if necessary.

Assessor guide: confirm that –

Methods for preparation of different conductors can be explained, including hose and pipe assemblies.

Criteria 18.72A.1.3

Conductors are assembled to specification.

Assessor guide: observe that –

Conductors assembled using appropriate equipment and techniques. Assembly is checked to ensure specifications met

Assessor guide: confirm that –

Specifications are understood. Different methods for assembling hose and pipe assemblies can be explained, including swaging, crimping, brazing/soldering.

Element 18.72A.2 Repair faulty conductors and assemblies

Criteria 18.72A.2.1

Faulty fluid conveying system conductors dismantled and repaired to manufacturer/industry standards and specifications.

Assessor guide: observe that –

Safety practices are followed at all times.

Assessor guide: confirm that –

Dismantle and repair procedures are understood.

Element 18.72A.3 Check/test conductor assemblies**Criteria 18.72A.3.1**

Operation of fluid conveying components and assemblies assessed against current industry standards and manufacturer specifications.

Assessor guide: observe that –
Procedures are followed correctly.

Assessor guide: confirm that –
Operational function and characteristics of fluid conveying installation and application category types is understood. Industry standards and manufacturer specifications are understood. Procedure to assess operation is understood.

Criteria 18.72A.3.2

Faulty fluid conveying components and assemblies identified and failure/potential to fail confirmed by inspection and testing using fluid power conveying principles, procedures and safety requirements.

Assessor guide: observe that –
Components identified correctly from circuit drawings, schematics, reference manuals and equipment specifications
All faults/ potential faults are identified.

Assessor guide: confirm that –
Fluid power conveying principles, procedures and safety requirements are understood.

Criteria 18.72A.3.3

Manufactured/repared components assembled, cleaned, tested and correct operation verified to ensure compliance with required specifications and standards.

Assessor guide: observe that –
Compliance/non-compliance with specifications is established.

Assessor guide: confirm that –
Procedures to assemble, clean, test are understood.

Range statement

Work undertaken using pre-determined standards of safety, quality and work procedures. Fluid conveying components and assemblies identified, inspected and assessed using fluid power principles or pre-determined specific interpretations from data and circuit diagrams. Conductor assemblies may apply to positive and negative pressure systems on fixed and mobile plant/equipment, including marine, heavy plant, manufacturing plant applications. Work undertaken to industry standards and manufacturer specifications. Fluid conveying components may include high pressure seals, seats, hoses, tubes, pipes, fittings, connectors, adaptors and anchors, and other associated attachments. System applications may include, but are not limited to hydraulic, pneumatic, water, gas, acids/corrosives/alkalines, abrasives, petroleum and other dry/wet media. Correct assembly and functional testing of fluid conveying components and assemblies may include: hose - skive and measurement tools, crimping and cleaning machines, lathes. Testing may be in-situ or using high pressure test rigs. System pressures would typically range from 10.5MPa to 35 MPa, ranging up to 70 MPa. Reference material for identification of parts may include manufacturer product catalogues, tables and charts. Where brazing/soldering is required, Unit 5.6A (Perform brazing and/or silver soldering) should also be selected. This unit is not to be selected when Unit 18.55A (Dismantle, replace and assemble engineering components) or Unit (18.52A Maintain and repair fluid power systems for mobile plant) has already been selected.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with fluid conveying systems or other competencies requiring the exercise of the skills and knowledge covered by this unit.

To undertake the elements of this competency an understanding of basic concepts of fluid power and fluid power components and their application to fluid conveying systems is required. This is considered important for the ability to work safely on systems containing stored energy devices (accumulators) and systems under pressure due to external forces.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 18.86A A Test, evacuate and charge refrigeration systems

Band – Specialisation band A

Field – Maintenance & diagnostics

Unit Weight 4

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices

9.2A Interpret technical drawing

18.1A Use hand tools

18.2A Use power tools/hand held operations

18.55A Dismantle, replace and assemble engineering components

Element 18.86A.1 Assess refrigeration system operation

Criteria 18.86A.1.1

Refrigeration system operating principles and terminology understood.

Assessor guide: observe that –

Assessor guide: confirm that –

The operating principles of refrigeration systems can be explained. The range of refrigerants available for use in refrigeration systems can be identified. The characteristics and properties of each type of refrigerant can be given. The safety precautions to be taken when handling or working with refrigerants can be given. The methods of identifying stored refrigerants can be given. The methods of identifying the type of refrigerant used in refrigeration systems can be described.

Criteria 18.86A.1.2

All relevant information is obtained and correctly interpreted prior to the commencement of work on the refrigeration system.

Assessor guide: observe that –

All relevant drawings, instructions, specifications, procedures, codes and regulations are obtained in accordance with workplace procedures.

Assessor guide: confirm that –

The correct refrigerant for the given system can be identified. The precautions to be taken when handling or working with the refrigerant can be given. The relevant codes and regulations applying to the given refrigeration system can be identified. The operating specifications of the refrigeration system can be identified.

Criteria 18.86A.1.3

Refrigeration system checks are undertaken safely in accordance with standard operating procedures, relevant codes and regulations.

Assessor guide: observe that –

Refrigeration system is checked safely in accordance with standard operating procedures, relevant codes and regulations.

Assessor guide: confirm that –

The procedures for testing/checking refrigeration systems can be given. The precautions to be taken when checking refrigeration systems can be identified.

Criteria 18.86A.1.4

Pressures and temperatures correctly determined and recorded.

Assessor guide: observe that –

Pressures and temperatures are correctly determined and recorded in accordance with standard operating procedures.

Assessor guide: confirm that –

The tests to be undertaken can be identified. The equipment and techniques to be used to determine pressures and temperatures can be identified. The procedures for recording refrigeration system test results can be given.

Criteria 18.86A.1.5

Faults are correctly isolated to component level and appropriate corrective action determined.

Assessor guide: observe that –

The refrigeration system components are checked for correct operation in accordance with standard operating procedures.

Assessor guide: confirm that –

The specifications of the refrigeration system components can be identified. Faulty components can be identified. The appropriate corrective action can be identified. The reasons for proposing the identified corrective action can be given.

Criteria 18.86A.1.6

The refrigeration system is checked for leaks.

Assessor guide: observe that –

The refrigeration system is checked for leaks safely using appropriate tools, techniques and equipment in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for checking refrigeration systems for leaks can be given. The types of leak detection equipment/techniques and their applications can be given. The method(s) of leak detection to be used for a given refrigeration system can be identified. The reasons for selecting the chosen method(s) can be explained. The safety precautions to be taken when leak testing refrigeration systems can be identified.

Criteria 18.86A.1.7

The refrigeration system is checked for contamination.

Assessor guide: observe that –

The refrigeration system is checked for contamination in accordance with standard operating procedures.

Assessor guide: confirm that –

The causes of contamination in refrigeration systems can be identified. The procedures, tools and equipment to be used to clean up contaminated systems can be identified. The effects of contaminants on refrigeration system performance can be explained.

Element 18.86A.2 Reclaim refrigerant and system evacuation**Criteria 18.86A.2.1**

The refrigeration system is evacuated in accordance with standard operating procedures, codes and regulations.

Assessor guide: observe that –

The appropriate tools, techniques and equipment are used to evacuate the refrigeration system in accordance with standard operating procedures, codes and regulations.

Assessor guide: confirm that –

The procedures for evacuating refrigeration systems can be identified. The tools, techniques and equipment required to carry out evacuation procedures can be identified. The appropriate evacuation procedure for a given refrigeration system can be identified. The reasons for selecting the chosen evacuation procedure can be explained.

Criteria 18.86A.2.2

The refrigerant evacuated from the refrigeration system is contained/disposed of in accordance with the relevant codes and regulations.

Assessor guide: observe that –

The evacuated refrigerant is contained/disposed of in accordance with standard operating procedures and the relevant codes and regulations. The quantities of refrigerant reclaimed from refrigeration systems are recorded/reported in accordance with standard operating procedures, codes and regulations. Where appropriate, the quantities of any refrigerant released into the atmosphere are recorded/reported in accordance with standard operating procedures, codes and regulations.

Assessor guide: confirm that –

The reasons for containing reclaimed refrigerant can be explained. The procedures for storing/disposing of reclaimed refrigerant can be given. The procedures for recording/reporting quantities of refrigerant reclaimed from refrigeration systems can be given. The procedures for recording/reporting quantities of refrigerant released into the atmosphere can be given. The consequences of releasing quantities of refrigerant into the atmosphere can be given.

Element 18.86A.3 Charge the refrigeration system**Criteria 18.86A.3.1**

The refrigeration system is charged with the correct refrigerant in accordance with standard operating procedures.

Assessor guide: observe that –

The refrigeration system is safely charged with the correct refrigerant in accordance with standard operating procedures and all relevant legislative and regulatory requirements.

Assessor guide: confirm that –

The procedures for charging refrigeration systems can be given. The correct refrigerant for a range of given applications can be identified. The tools, techniques and equipment required to charge a refrigeration system with refrigerant can be given. The precautions to be taken when charging refrigeration systems with refrigerant can be given.

Criteria 18.86A.3.2

The appropriate lubricating oil is added to the refrigeration system in accordance with standard operating procedures.

Assessor guide: observe that –

The correct lubricating oil for the given application is added to the refrigeration system in accordance with standard operating procedures and all relevant legislation and regulations.

Assessor guide: confirm that –

The procedures for adding lubricating oil to refrigeration systems can be given. The properties of refrigeration oil can be identified. The appropriate refrigeration oil for a range of given applications can be identified. The reasons for selecting the chosen refrigeration oil can be explained. The function of the refrigeration oil in the refrigeration system can be explained.

Criteria 18.86A.3.3

The refrigeration system is checked for leaks.

Assessor guide: observe that –

The refrigeration system is checked for leaks safely, using appropriate tools, techniques and equipment in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for checking refrigeration systems for leaks can be given.

Range statement

Work is undertaken autonomously or in a team environment using predetermined standards of safety, quality and workshop procedures. Refrigeration systems may be associated with refrigeration and air conditioning applications including commercial, industrial and transport. All work is to be undertaken in accordance with all relevant state or territory legislation and regulatory requirements. Refrigerants include CFCs, HFCs, ammonia, etc.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. Assessment should be conducted in an environment that the individual is familiar with.

Critical aspects

This unit could be assessed in conjunction with other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the testing, evacuating and charging of refrigeration systems or other competencies requiring the exercise of the skills and knowledge covered by this unit.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant data sheets, catalogues, circuit diagrams and engineering drawings. The candidate will be required to: - Orally, or by methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment, the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities.

Unit MEM 18.87A A Service and repair domestic and light commercial refrigeration and air conditioning equipment

Band – Specialisation band A

Field – Maintenance & diagnostics

Unit Weight 6

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices

18.1A Use hand tools

9.2A Interpret technical drawing

18.2A Use power tools/hand held operations

12.2A Electrical/electronic measurement

18.55A Dismantle, replace and assemble engineering components

18.86A Test, evacuate and charge refrigeration systems

Element 18.87A.1 Undertake preventive maintenance checks/adjustment on domestic air conditioning/refrigeration equipment

Criteria 18.87A.1.1

Visual inspection and testing with appropriate test equipment is carried out according to refrigeration/air conditioning principles, procedures and safety requirements.

Assessor guide: observe that –

Testing is carried out to accepted standards in a safe manner.

Assessor guide: confirm that –

Correct test procedures can be identified and described.

Criteria 18.87A.1.2

Preventative maintenance tasks are performed according to manufacturers specifications using refrigeration/air conditioning techniques/practices.

Assessor guide: observe that –

All work is carried out to accepted standards and to specifications where applicable.

Assessor guide: confirm that –

Frequency and reason for preventative maintenance is understood.

Element 18.87A.2 Undertake fault finding on domestic refrigeration/air conditioning equipment

Criteria 18.87A.2.1

Equipment components identified correctly.

Assessor guide: observe that –

Components on a range of equipment can be accurately identified.

Assessor guide: confirm that –

Variations in component identities can be explained.

<p>Criteria 18.87A.2.2 The characteristics and operation of each component is understood.</p>	<p><i>Assessor guide: observe that –</i></p>	<p><i>Assessor guide: confirm that –</i> Operation and characteristics of range if components can be described.</p>
<p>Criteria 18.87A.2.3 The operational function of each component is inspected and tested.</p>	<p><i>Assessor guide: observe that –</i> All refrigeration/air conditioning system components are checked for correct operation using appropriate tools, techniques and equipment in accordance with standard operating procedures.</p>	<p><i>Assessor guide: confirm that –</i> The procedures for checking refrigeration/air conditioning components for correct operation can be given. The tools, techniques and equipment necessary to check refrigeration/air conditioning system components for correct operation can be identified.</p>
<p>Criteria 18.87A.2.4 Correct operation of each component assessed against specification.</p>	<p><i>Assessor guide: observe that –</i> Component performance/operation is compared against specification.</p>	<p><i>Assessor guide: confirm that –</i> Specifications are obtained, interpreted and understood.</p>

Element 18.87A.3 Repair/replace faulty domestic refrigeration/air conditioning components

<p>Criteria 18.87A.3.1 Faulty components are localised and malfunction confirmed by inspection and testing using refrigeration and air conditioning principles, procedures and safety requirements.</p>	<p><i>Assessor guide: observe that –</i> Where appropriate, faulty components are identified for repair or replacement.</p>	<p><i>Assessor guide: confirm that –</i> The procedures for identifying components for repair or replacement can be given.</p>
<p>Criteria 18.87A.3.2 The refrigerant is removed safely from the system and contained in accordance with standard operating procedures and regulatory requirements where appropriate.</p>	<p><i>Assessor guide: observe that –</i> The refrigerant is evacuated and contained in a safe and appropriate manner, meeting all necessary requirements.</p>	<p><i>Assessor guide: confirm that –</i> Evacuation, containment and storage procedures can be identified and explained.</p>
<p>Criteria 18.87A.3.3 Faulty components are dismantled and repaired to manufacturer's specifications as required.</p>	<p><i>Assessor guide: observe that –</i> Repairs are undertaken in a safe and reliable manner using correct techniques and accepted practices.</p>	<p><i>Assessor guide: confirm that –</i> The effect of poor repair practices can be described.</p>

Criteria 18.87A.3.4

Replacement parts selected from manufacturer's catalogues according to required specifications.

Assessor guide: observe that –

Relevant catalogues/lists are used.

Assessor guide: confirm that –

Process to select replacement parts can be described, particularly when catalogues etc are not available.

Element 18.87A.4 Return to service domestic refrigeration/air conditioning equipment**Criteria 18.87A.4.1**

Components are reassembled and tested for correct operation and assessed against specification.

Assessor guide: observe that –

Assembly and testing procedures are followed correctly and thoroughly.

Assessor guide: confirm that –

Assembly and testing procedures can be identified and explained.

Criteria 18.87A.4.2

Using domestic refrigeration/air conditioning principles and system application techniques, correct operation of the equipment is verified.

Assessor guide: observe that –

The temperatures, flows, pressures, air properties and noise/vibration levels achieved as a result of the adjustments made are recorded/reported in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for adjusting refrigeration/air conditioning systems for correct operation in accordance with specifications can be given.

Criteria 18.87A.4.3

Maintenance records/service reports completed by appropriate designated means.

Assessor guide: observe that –

Where appropriate, authorised out-of specification adjustments are recorded in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for obtaining authorisation of adjustments outside of operational specifications can be given. The person(s) responsible for authorising adjustments outside of specifications can be identified. The reasons adjustments outside of specification may be made can be given. The tools, techniques and equipment required to adjust the refrigeration/air conditioning system to specification can be identified.

Range statement

This unit applies servicing of domestic and light commercial refrigeration and air conditioning equipment and components. Work is carried out autonomously or in a team environment. Interpret drawings and diagrams of refrigeration and air conditioning equipment, and utilise basic fault finding procedures, service manifolds, and test equipment to identify and diagnose faults in equipment; and isolate faulty components including control components and rectify common faults. They are able to retro fit existing domestic and light commercial refrigeration and air conditioning equipment with alternative refrigerants, recondition components, return to service and test equipment, and complete service reports for administrative action. Where any rectification, modification involves electrical disconnection and reconnection, then Unit 18.49A (Disconnect/reconnect fixed wired equipment up to 1000vAC/1500vDC) should also be considered. When there is a requirement to remove and replace components by brazing and or silver soldering Unit 5.6A (Perform brazing and/or silver soldering) should also be accessed.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with refrigeration and air conditioning or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 18.88A A Maintain and repair commercial air conditioning systems and components

Band – Specialisation band A

Field – Maintenance & diagnostics

Unit Weight 4

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices

18.1A Use hand tools

9.2A Interpret technical drawing

18.2A Use power tools/hand held operations

12.2A Electrical/electronic measurement

18.55A Dismantle, replace and assemble engineering components

18.86A Test, evacuate and charge refrigeration systems

Element 18.88A.1 Undertake preventive maintenance checks/adjustment on commercial air conditioning systems and components

Criteria 18.88A.1.1

The temperature, quality, properties and flow of air delivered by the air conditioning system is checked for conformance to specification.

Assessor guide: observe that –

Appropriate measuring equipment selected and used to check that the temperature, flow and quality of the conditioned air conforms to specification. Appropriate measuring instruments/equipment selected and used to check that the air properties conform to specification. All non conforming measurements are correctly identified.

Assessor guide: confirm that –

The appropriate measuring instruments/equipment for checking air temperatures, air flows, air quality and air properties can be identified. The appropriate specifications required for checking air temperatures, air flows, air quality and air properties can be identified. The procedures for reporting non conformances can be given. The air properties controlled by the air conditioning system can be identified.

Criteria 18.88A.1.2

The noise/vibration levels of the air conditioning system components are checked for conformance to specification.

Assessor guide: observe that –

Appropriate measuring instruments/equipment selected and used to check noise and vibration levels of the system components are within specifications. Abnormal noise/vibration is correctly identified.

Assessor guide: confirm that –

The appropriate measuring instruments/equipment required for checking component noise and vibration levels can be identified. The appropriate specifications for checking component noise and vibration levels can be identified. The procedures for reporting abnormal noise/vibration can be given.

Criteria 18.88A.1.3

Preventative maintenance tasks are performed according to manufacturer's specifications using refrigeration and air conditioning principles, techniques.

Assessor guide: observe that –

The preventative maintenance procedures are performed in accordance standard operating procedures and all legislative and regulatory requirements.

Assessor guide: confirm that –

The appropriate procedures and sequence for performing preventative maintenance on an air conditioning system can be identified.

Element 18.88A.2 Undertake fault finding on commercial air conditioning systems and components**Criteria 18.88A.2.1**

System components identified correctly.

Assessor guide: observe that –

The system components correctly identified from specifications.

Assessor guide: confirm that –

The specifications and process for identifying system components can be given.

Criteria 18.88A.2.2

The characteristics and operation of each component is understood.

Assessor guide: observe that –

Assessor guide: confirm that –

The operational characteristics of the system components can be given.

Criteria 18.88A.2.3

The operational function of each component is inspected and tested.

Assessor guide: observe that –

The system components are inspected and tested in accordance standard operating procedures.

Assessor guide: confirm that –

The appropriate procedures for inspecting and testing system components can be identified.

Criteria 18.88A.2.4

Correct operation of each component assessed against system specification.

Assessor guide: observe that –

The operation of each system component is assessed against system specification in accordance standard operating procedures.

Assessor guide: confirm that –

The appropriate procedures for assessing that the operation of system components meet system specification can be identified.

Element 18.88A.3 Repair/replace faulty commercial air conditioning components**Criteria 18.88A.3.1**

Faulty components are localised and malfunction confirmed by inspection and testing using air conditioning principles, procedures and safety requirements.

Assessor guide: observe that –

The faulty components are localised and malfunction confirmed in accordance standard operating procedures.

Assessor guide: confirm that –

The appropriate process for localising and confirming faulty components can be given.

Criteria 18.88A.3.2

The refrigerant is removed safely from the system and contained in accordance with standard operating procedures and regulatory requirements where appropriate.

Assessor guide: observe that –

The refrigerant is safely removed in accordance with standard operating procedures and all legislative and regulatory requirements.

Assessor guide: confirm that –

The procedures and all legislative and regulatory requirements for safely removing the refrigerant from the system can be identified.

Criteria 18.88A.3.3

Faulty components are dismantled and repaired to manufacturer's specifications as required.

Assessor guide: observe that –

The faulty components dismantled and repaired in accordance standard operating procedures.

Assessor guide: confirm that –

The appropriate procedures for dismantling and repairing faulty components can be identified.

Criteria 18.88A.3.4

Replacement parts selected from manufacturer's catalogues according to required specifications.

Assessor guide: observe that –

Assessor guide: confirm that –

The procedures for selecting replacement parts can be given.

Element 18.88A.4 Return to service commercial air conditioning system and components**Criteria 18.88A.4.1**

Components are reassembled and tested for correct operation and assessed against specification.

Assessor guide: observe that –

The components reassembled and tested in accordance standard operating procedures.

Assessor guide: confirm that –

The appropriate procedures for reassembling and testing components can be identified.

Criteria 18.88A.4.2

The system is charged with correct refrigerant safely in accordance with standard operating procedures and regulatory requirements where appropriate.

Assessor guide: observe that –

The system is correctly and safely charged with refrigerant in accordance standard operating procedures and all legislative and regulatory requirements.

Assessor guide: confirm that –

The procedures and all legislative and regulatory requirements for safely charging the system be identified.

Criteria 18.88A.4.3

Using air conditioning principles, correct operation of the equipment is verified.

Assessor guide: observe that –

The operation of each system component is assessed against system specification in accordance standard operating procedures.

Assessor guide: confirm that –

The appropriate procedures for assessing that the operation of system components meet system specification can be identified.

Criteria 18.88A.4.4

Maintenance records/service reports completed by appropriate designated means.

Assessor guide: observe that –

Maintenance records/service reports completed in accordance standard operating procedures.

Assessor guide: confirm that –

The appropriate procedures for completing maintenance records/service reports can be identified.

Range statement

This unit applies maintenance and repair of commercial air conditioning systems and components, which may include heating systems, direct expansion refrigeration systems, simple air distribution systems, typically used for comfort air conditioning. Work is carried out autonomously or in a team environment and includes interpreting drawings and diagrams of commercial air conditioning systems. Utilising fault-finding procedures, service manifolds, and test equipment to identify and diagnose faults in systems to isolate faulty components and rectify common faults return to service, test systems, and complete service reports. Work may also include retrofitting existing commercial air conditioning systems with alternative refrigerants and reconditioning components. Where the refitting or repair/replacement of components involves the fabrication and installation of pipework and assemblies Unit 10.10A (Install pipework and pipework assemblies) should be accessed. Where any rectification, modification involves electrical disconnection and reconnection, then Unit 18.49A (Disconnect/reconnect fixed wired equipment up to 1000vAC/1500vDC) should also be considered. When there is a requirement to remove and replace of components by brazing and/or silver soldering Unit 5.6A (Perform brazing and/or silver soldering) should also be accessed.

Evidence guide

Assessment context

This unit should be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with air conditioning service work or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 18.89A A Maintain and repair large central air handling systems

Band – Specialisation band A

Field – Maintenance & diagnostics

Unit Weight 6

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices

18.1A Use hand tools

9.2A Interpret technical drawing

18.2A Use power tools/hand held operations

12.2A Electrical/electronic measurement

18.55A Dismantle, replace and assemble engineering components

Element 18.89A.1 Undertake preventive maintenance checks/adjustment on large central air handling systems

Criteria 18.89A.1.1

The temperature, humidity, quality, pressure and flow of air delivered to zones by the air handling system is checked for conformance to specification.

Assessor guide: observe that –

Appropriate measuring equipment selected and used to check that the temperature, humidity, quality, pressure and flow of the air delivered to the zones conforms to specification. All non conforming measurements are correctly identified.

Assessor guide: confirm that –

The appropriate measuring instruments/equipment for checking humidity, air temperatures, air flows, air quality and air pressure can be identified. The appropriate specifications required for checking humidity, air temperatures, air flows, air quality and air pressure can be identified. The procedures for reporting non conformances can be given. The air properties controlled by the air handling system can be identified.

Criteria 18.89A.1.2

The noise/vibration levels of the air handling sub systems are checked for conformance to specification.

Assessor guide: observe that –

Appropriate measuring instruments/equipment selected and used to check noise and vibration levels of the sub systems are within specifications. Abnormal noise/vibration is correctly identified.

Assessor guide: confirm that –

The appropriate measuring instruments/equipment required for checking sub system noise and vibration levels can be identified. The appropriate specifications for checking sub system noise and vibration levels can be identified. The procedures for reporting abnormal noise/vibration can be given.

Criteria 18.89A.1.3

Preventative maintenance tasks are performed according to manufacturer's specifications using appropriate refrigeration and air conditioning techniques/practices.

Assessor guide: observe that –

The preventative maintenance procedures are performed in accordance standard operating procedures and all legislative and regulatory requirements.

Assessor guide: confirm that –

The appropriate procedures and sequence for performing preventative maintenance on an air conditioning system can be identified.

Element 18.89A.2 Undertake fault finding on large central air handling system

Criteria 18.89A.2.1

Components of sub systems correctly identified.

Assessor guide: observe that –
Primary and secondary refrigerant, or air distribution/reticulation systems correctly identified from specifications.

Assessor guide: confirm that –
The specifications of and process for identifying primary and secondary refrigerant, or air distribution/reticulation systems can be given.

Criteria 18.89A.2.2

The characteristics and operation of each sub system component understood.

Assessor guide: observe that –

Assessor guide: confirm that –
The operational characteristics of each sub system component can be given.

Criteria 18.89A.2.3

The operational function of each sub system component inspected and tested.

Assessor guide: observe that –
The sub system components are inspected and tested in accordance standard operating procedures.

Assessor guide: confirm that –
The appropriate procedures for inspecting and testing each sub system component can be identified.

Criteria 18.89A.2.4

Correct operation of each component assessed against specification.

Assessor guide: observe that –
The operation of each component is assessed against system specification in accordance standard operating procedures.

Assessor guide: confirm that –
The appropriate procedures for assessing that the operation of the components meet system specification can be identified.

Element 18.89A.3 Repair/replace faulty air handling components

Criteria 18.89A.3.1

Faulty components are localised and malfunction confirmed by inspection and testing using air conditioning principles, procedures and safety requirements.

Assessor guide: observe that –
The faulty components are localised and malfunction confirmed in accordance standard operating procedures.

Assessor guide: confirm that –
The appropriate process for localising and confirming faulty components can be given.

Criteria 18.89A.3.2

Faulty components are dismantled and repaired to manufacturers specifications as required.

Assessor guide: observe that –
The faulty components dismantled and repaired in accordance standard operating procedures.

Assessor guide: confirm that –
The appropriate procedures for dismantling and repairing faulty components can be identified.

Criteria 18.89A.3.3

Replacement parts selected from manufacturer's catalogues according to required specifications.

Assessor guide: observe that –

Assessor guide: confirm that –

The procedures for selecting replacement parts can be given.

Element 18.89A.4 Return to service large central air handling system**Criteria 18.89A.4.1**

Components are reassembled and tested for correct operation and assessed against specification.

Assessor guide: observe that –

The components reassembled and tested in accordance standard operating procedures.

Assessor guide: confirm that –

The appropriate procedures for reassembling and testing components can be identified.

Criteria 18.89A.4.2

Using air handling principles and techniques correct operation of the equipment is verified.

Assessor guide: observe that –

The operation of each system component is assessed against system specification in accordance standard operating procedures.

Assessor guide: confirm that –

The appropriate procedures for assessing that the operation of system components meet system specification can be identified.

Criteria 18.89A.4.3

Maintenance records/service reports completed by appropriate designated means.

Assessor guide: observe that –

Maintenance records/service reports completed in accordance standard operating procedures.

Assessor guide: confirm that –

The appropriate procedures for completing maintenance records/service reports can be identified.

Range statement

This unit applies maintenance and repair of large central air handling systems, which may include boilers, chillers, secondary refrigeration pumps, dehumidifiers, odour control, complex filtering systems, multi zone air distribution systems etc. typically used for comfort air conditioning. Work is carried out autonomously or in a team environment, and includes interpreting drawings and diagrams of large central air handling systems. Utilising fault finding procedures, and test equipment to identify and diagnose faults in systems to isolate faulty components, rectify faults, return to service test the systems and complete service reports. Where the refitting or repair/replacement of components involves the fabrication and installation of pipework and assemblies Unit 10.10A (Install pipework and pipework assemblies) should be accessed. Where any rectification, modification involves electrical disconnection and reconnection, then Unit 18.49A (Disconnect/reconnect fixed wired equipment up to 1000vAC/1500vDC) should also be considered. Where there is a requirement to remove and replace components by brazing and/or silver soldering Unit 5.6 (Perform brazing and/or silver soldering) should also be accessed. Where there is a requirement for maintaining/dosing water cooling towers and treatment systems in accordance legislative and regulatory requirements Unit 13.7A (Maintain water cooling towers and treatment systems) should be accessed.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with precision mechanical measurements or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 18.90A A Maintain and repair industrial refrigeration systems and components

Band – Specialisation band A

Field – Maintenance & diagnostics

Unit Weight 6

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices

18.1A Use hand tools

9.2A Interpret technical drawing

18.2A Use power tools/hand held operations

12.2A Electrical/electronic measurement

18.55A Dismantle, replace and assemble engineering components

18.86A Test, evacuate and charge refrigeration systems

Element 18.90A.1 Undertake preventive maintenance checks/adjustment on industrial refrigeration systems and components

Criteria 18.90A.1.1

The temperature and properties of the controlled medium/s is checked for conformance to specification.

Assessor guide: observe that –

Appropriate measuring equipment selected and used to check that the temperature of the controlled medium(s) conforms to specification. Appropriate measuring instruments/equipment selected and used to check that the properties of the controlled medium/s conform to specification. All non conforming measurements are correctly identified.

Assessor guide: confirm that –

The appropriate measuring instruments/equipment for checking the temperature(s) and properties of the controlled medium(s) can be identified. The appropriate specifications required for checking temperature(s) and properties of the controlled medium(s) can be identified. The procedures for reporting non conformances can be given. The air properties controlled by the controlled medium(s) can be identified.

Criteria 18.90A.1.2

The noise/vibration levels of the industrial refrigeration system components are checked for conformance to specification.

Assessor guide: observe that –

Appropriate measuring instruments/equipment selected and used to check noise and vibration levels of the system components are within specifications. Abnormal noise/vibration is correctly identified.

Assessor guide: confirm that –

The appropriate measuring instruments/equipment required for checking components noise and vibration levels can be identified. The procedures for reporting abnormal noise/vibration can be given.

Criteria 18.90A.1.3

Preventative maintenance tasks and plant room safety equipment checks are performed according to manufacturers specifications using refrigeration principles techniques/practices.

Assessor guide: observe that –

The preventative maintenance procedures and plant room safety equipment checks are performed in accordance standard operating procedures and all legislative and regulatory requirements.

Assessor guide: confirm that –

The procedures and sequence for performing preventative maintenance on an air conditioning system can be identified. The procedures and sequence for performing plant room safety equipment checks can be identified.

Element 18.90A.2 Undertake fault finding on industrial refrigeration systems and components**Criteria 18.90A.2.1**

System components identified correctly.

Assessor guide: observe that –

The system components correctly identified from specifications.

Assessor guide: confirm that –

The specifications and process for identifying system components can be given.

Criteria 18.90A.2.2

The characteristics and operation of each component is understood.

Assessor guide: observe that –

Assessor guide: confirm that –

The operational characteristics of the system components can be given.

Criteria 18.90A.2.3

The operational function of each component is inspected and tested.

Assessor guide: observe that –

The system components are inspected and tested in accordance standard operating procedures.

Assessor guide: confirm that –

The appropriate procedures for inspecting and testing system components can be identified.

Criteria 18.90A.2.4

Correct operation of each component assessed against specification.

Assessor guide: observe that –

The operation of each system component is assessed against system specification in accordance standard operating procedures.

Assessor guide: confirm that –

The appropriate procedures for assessing that the operation of system components meet system specification can be identified.

Element 18.90A.3 Repair/replace faulty industrial refrigeration components

Criteria 18.90A.3.1

Faulty components are localised and malfunction confirmed by inspection and testing using industrial refrigeration principles, procedures and safety requirements.

Assessor guide: observe that –

The faulty components are localised and malfunction confirmed in accordance standard operating procedures.

Assessor guide: confirm that –

The appropriate process for localising and confirming faulty components can be given.

Criteria 18.90A.3.2

The refrigerant is removed safely from the system and contained in accordance with standard operating procedures and regulatory requirements where appropriate.

Assessor guide: observe that –

The refrigerant is safely removed in accordance with standard operating procedures and all legislative and regulatory requirements.

Assessor guide: confirm that –

The procedures and all legislative and regulatory requirements for safely removing the refrigerant from the system can be identified.

Criteria 18.90A.3.3

Faulty components are dismantled and repaired to manufacturers specifications as required.

Assessor guide: observe that –

The faulty components dismantled and repaired in accordance standard operating procedures.

Assessor guide: confirm that –

The appropriate procedures for dismantling and repairing faulty components can be identified.

Criteria 18.90A.3.4

Replacements parts selected from manufacturers catalogues according to required specifications.

Assessor guide: observe that –

Assessor guide: confirm that –

The procedures for selecting replacement parts can be given.

Element 18.90A.4 Return to service industrial refrigeration system and components

Criteria 18.90A.4.1

Components are reassembled and tested for correct operation and assessed against specification.

Assessor guide: observe that –

The components reassembled and tested in accordance standard operating procedures.

Assessor guide: confirm that –

The appropriate procedures for reassembling and testing components can be identified.

Criteria 18.90A.4.2

The system is charged with correct refrigerant safely in accordance with standard operating procedures and regulatory requirements where appropriate.

Assessor guide: observe that –

The system is correctly and safely charged with refrigerant in accordance standard operating procedures and all legislative and regulatory requirements.

Assessor guide: confirm that –

The procedures and all legislative and regulatory requirements for safely charging the system be identified.

Criteria 18.90A.4.3

Using industrial refrigeration principles and system application techniques correct operation of the equipment is verified.

Assessor guide: observe that –

The operation of each system component is assessed against equipment specification in accordance standard operating procedures.

Assessor guide: confirm that –

The appropriate procedures for assessing that the operation of system components meet equipment specification can be identified.

Criteria 18.90A.4.4

Maintenance records/service reports completed by appropriate designated means.

Assessor guide: observe that –

Maintenance records/service reports completed in accordance standard operating procedures.

Assessor guide: confirm that –

The appropriate procedures for completing maintenance records/service reports can be identified.

Range statement

The unit applies maintenance and repair of industrial refrigeration systems that may include large capacity (ammonia) plant typically used for product/process temperature/environment control. Work is carried out autonomously or in a team environment, and includes interpreting drawings and diagrams of industrial refrigeration systems. Utilising fault finding procedures, service manifolds, and test equipment to identify and diagnose faults in systems to isolate faulty components, rectify faults, return to service, test the systems and complete service reports. The work may also include retrofitting existing industrial refrigeration systems and reconditioning components. Where the refitting or repair/replacement of components involves the fabrication and installation of pipework and assemblies Unit 10.10A (Install pipework and pipework assemblies) should be accessed. Where any rectification, modification involves electrical disconnection and reconnection, then Unit 18.49A (Disconnect/reconnect fixed wired equipment up to 1000vAC/1500vDC) should also be considered. Where there is a requirement to remove and replace of components by brazing and/or silver soldering Unit 5.6A (Perform brazing and/or silver soldering) should also be accessed.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with precision mechanical measurements or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 18.91A A Maintain and repair multi stage, cascade and/or ultra-cold industrial refrigeration systems

Band – Specialisation band A

Field – Maintenance & diagnostics

Unit Weight 4

Notes - This unit has dual status and is to be regarded as both a Specialisation band A unit and Specialisation band B unit for progression to C5 (AQF V)

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices
18.1A Use hand tools

9.2A Interpret technical drawing
18.2A Use power tools/hand held operations

12.2A Electrical/electronic measurement
18.55A Dismantle, replace and assemble engineering components

18.86A Test, evacuate and charge refrigeration systems

18.87A Service and repair domestic and light commercial refrigeration and air conditioning equipment

Pre-requisite units - Path 2

2.5C11 Measure with graduated devices
18.1A Use hand tools

9.2A Interpret technical drawing
18.2A Use power tools/hand held operations

12.2A Electrical/electronic measurement
18.55A Dismantle, replace and assemble engineering components

18.86A Test, evacuate and charge refrigeration systems

18.90A Maintain and repair industrial refrigeration systems and components

Pre-requisite units - Path 3

2.5C11 Measure with graduated devices
18.1A Use hand tools

9.2A Interpret technical drawing
18.2A Use power tools/hand held operations

12.2A Electrical/electronic measurement
18.55A Dismantle, replace and assemble engineering components

18.86A Test, evacuate and charge refrigeration systems

18.88A Maintain and repair commercial air conditioning systems and components

Element 18.91A.1 Undertake preventive maintenance checks/adjustment on multi stage, cascade and/or ultra cold industrial refrigeration systems

Criteria 18.91A.1.1

The temperature, pressure and properties of the multi stage, cascade and/or ultra cold refrigeration system is checked for conformance to specification.

Assessor guide: observe that –

Appropriate measuring equipment selected and used to check that the temperature of the controlled medium/s conforms to specification. Appropriate measuring instruments/equipment selected and used to check that the properties of the controlled medium/s conform to specification. All non conforming measurements are correctly identified.

Assessor guide: confirm that –

The appropriate measuring instruments/equipment for checking the temperature/s and properties of the controlled medium/s can be identified. The appropriate specifications required for checking temperature(s) and properties of the controlled medium(s) can be identified. The procedures for reporting non conformances can be given. The air properties controlled by the controlled medium(s) can be identified.

Criteria 18.91A.1.2

The noise/vibration levels of the multi stage, cascade and/or ultra cold refrigeration system is checked for conformance to specification.

Assessor guide: observe that –

Appropriate measuring instruments/equipment selected and used to check noise and vibration levels of the system components are within specifications. Abnormal noise/vibration is correctly identified.

Assessor guide: confirm that –

The appropriate measuring instruments/equipment required for checking components noise and vibration levels can be identified. The procedures for reporting abnormal noise/vibration can be given.

Criteria 18.91A.1.3

Preventative maintenance tasks are performed according to manufacturer's specifications using refrigeration techniques/practices.

Assessor guide: observe that –

The preventative maintenance procedures and safety equipment checks are performed in accordance standard operating procedures and all legislative and regulatory requirements.

Assessor guide: confirm that –

The procedures and sequence for performing preventative maintenance on an air conditioning system can be identified. The procedures and sequence for performing safety equipment checks can be identified.

Element 18.91A.2 Undertake fault finding on multi stage, cascade and/or ultra cold industrial refrigeration system**Criteria 18.91A.2.1**

System components identified correctly.

Assessor guide: observe that –

The system components correctly identified from specifications.

Assessor guide: confirm that –

The specifications and process for identifying system components can be given.

Criteria 18.91A.2.2

The characteristics and operation of each component is understood.

Assessor guide: observe that –

Assessor guide: confirm that –

The operational characteristics of the system components can be given.

Criteria 18.91A.2.3

The operational function of each component is inspected and tested.

Assessor guide: observe that –

The system components are inspected and tested in accordance standard operating procedures.

Assessor guide: confirm that –

The appropriate procedures for inspecting and testing system components can be identified.

Criteria 18.91A.2.4

Correct operation of each component assessed against specification.

Assessor guide: observe that –

The operation of each system component is assessed against system specification in accordance standard operating procedures.

Assessor guide: confirm that –

The appropriate procedures for assessing that the operation of system components meet system specification can be identified.

Element 18.91A.3 Repair/replace faulty components**Criteria 18.91A.3.1**

Faulty components are localised and malfunction confirmed by inspection and testing using industrial refrigeration principles, procedures and safety requirements.

Assessor guide: observe that –

The faulty components are localised and malfunction confirmed in accordance standard operating procedures.

Assessor guide: confirm that –

The appropriate process for localising and confirming faulty components can be given.

Criteria 18.91A.3.2

The refrigerant is removed safely from the system and contained in accordance with standard operating procedures and regulatory requirements where appropriate.

Assessor guide: observe that –

The refrigerant is safely removed in accordance with standard operating procedures and all legislative and regulatory requirements.

Assessor guide: confirm that –

The procedures and all legislative and regulatory requirements for safely removing the refrigerant from the system can be identified.

Criteria 18.91A.3.3

Faulty components are dismantled and repaired to manufacturer's specifications as required.

Assessor guide: observe that –

The faulty components dismantled and repaired in accordance standard operating procedures.

Assessor guide: confirm that –

The appropriate procedures for dismantling and repairing faulty components can be identified.

Criteria 18.91A.3.4

Replacement parts selected from manufacturer's catalogues according to required specifications.

Assessor guide: observe that –

Assessor guide: confirm that –

The procedures for selecting replacement parts can be given.

Element 18.91A.4 Return to service multi stage, cascade and/or ultra cold refrigeration system**Criteria 18.91A.4.1**

Components are reassembled and tested for correct operation and assessed against specification.

Assessor guide: observe that –

The components reassembled and tested in accordance standard operating procedures.

Assessor guide: confirm that –

The appropriate procedures for reassembling and testing components can be identified.

Criteria 18.91A.4.2

The system is charged with correct refrigerant safely in accordance with standard operating procedures and regulatory requirements where appropriate.

Assessor guide: observe that –

The system is correctly and safely charged with refrigerant in accordance standard operating procedures and all legislative and regulatory requirements.

Assessor guide: confirm that –

The procedures and all legislative and regulatory requirements for safely charging the system be identified.

Criteria 18.91A.4.3

Using industrial refrigeration principles and system application techniques correct operation of the equipment is verified.

Assessor guide: observe that –

The operation of each system component is assessed against equipment specification in accordance standard operating procedures.

Assessor guide: confirm that –

The appropriate procedures for assessing that the operation of system components meet equipment specification can be identified.

Criteria 18.91A.4.4

Maintenance records/service reports completed by appropriate designated means.

Assessor guide: observe that –

Maintenance records/service reports completed in accordance standard operating procedures.

Assessor guide: confirm that –

The appropriate procedures for completing maintenance records/service reports can be identified.

Range statement

This unit applies to the maintenance and repair of multi stage, cascade cryogenic and ultra cold industrial refrigeration systems. Work is carried out autonomously or in a team environment. Interpret drawings and diagrams of complex industrial refrigeration systems and utilising fault finding procedures and test equipment to identify and diagnose faults in systems; and isolate faulty components and rectify common faults. They are able to retrofit existing industrial refrigeration systems, recondition components, return to service and test systems, and complete service reports for administrative action. Where the refitting or repair/replacement of components involves the fabrication and installation of pipework and assemblies, Unit 10.10A (Install pipework and pipework assemblies) should be accessed. Where any rectification, modification involves electrical disconnection and reconnection, the Unit 18.49A (Disconnect/reconnect fixed wired equipment up to 1000vAC/1500vDC) should also be considered. Where there is a requirement and replace of components by brazing and/or silver soldering, Unit 5.6A (Perform brazing and/or silver soldering) should also be accessed.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with refrigeration or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 18.92A A Maintain and repair commercial and/or industrial refrigeration and/or air conditioning controls

Band – Specialisation band A

Field – Maintenance & diagnostics

Unit Weight 6

Notes - This unit has dual status and is to be regarded as both a Specialisation band A unit and Specialisation band B unit for progression to C7 (AQF IV)

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices

18.1A Use hand tools

9.2A Interpret technical drawing

18.2A Use power tools/hand held operations

12.2A Electrical/electronic measurement

18.55A Dismantle, replace and assemble engineering components

18.86A Test, evacuate and charge refrigeration systems

18.88A Maintain and repair commercial air conditioning systems and components

Pre-requisite units - Path 2

2.5C11 Measure with graduated devices

18.1A Use hand tools

9.2A Interpret technical drawing

18.2A Use power tools/hand held operations

12.2A Electrical/electronic measurement

18.55A Dismantle, replace and assemble engineering components

18.86A Test, evacuate and charge refrigeration systems

18.90A Maintain and repair industrial refrigeration systems and components

Element 18.92A.1 Install/replace refrigeration/air conditioning controls

Criteria 18.92A.1.1

Refrigeration/air conditioning control principles and system diagrams interpreted and understood.

Assessor guide: observe that –

System/circuit diagrams, system operation and control data obtained in accordance with work site procedures.

Assessor guide: confirm that –

The system operational requirements and specifications can be identified. The application of common refrigeration/air conditioning system components and controllers can be identified.

Criteria 18.92A.1.2

Control circuit components identified and inspected for compliance to specifications.

Assessor guide: observe that –

System/circuit components are checked/inspected for compliance to specifications.

Assessor guide: confirm that –

The system/circuit components can be identified.

Criteria 18.92A.1.3

Sequential installation undertaken according to manufacturer's specifications and standard operating procedures.

Assessor guide: observe that –

Specifications addressed and procedures followed during any installation work.

Assessor guide: confirm that –

The importance of following installation procedures can be explained in terms of control operation, safety and reliability.

Element 18.92A.2 Check and adjust refrigeration/air conditioning control sequence and operation**Criteria 18.92A.2.1**

The temperature, quality, pressure and properties of the air delivered by the air conditioning system is checked for conformance to specification.

Assessor guide: observe that –

Appropriate measuring equipment selected and used to check that the temperature, flow and quality of the conditioned air conforms to specification. Appropriate measuring instruments/equipment selected and used to check that the air properties conform to specification. All non conforming measurements are correctly identified.

Assessor guide: confirm that –

The appropriate measuring instruments/equipment for checking air temperatures, air flows, air quality and air properties can be identified. The appropriate specifications required for checking air temperatures, air flows, air quality and air properties can be identified. The procedures for reporting non conformances can be given. The air properties controlled by the air conditioning system can be identified.

Criteria 18.92A.2.2

Controls operation checked against operational specifications using appropriate test equipment and application principles/techniques.

Assessor guide: observe that –

Appropriate test equipment is used to check control and system operation against specifications in accordance with work site procedures.

Assessor guide: confirm that –

Refrigeration/air conditioning test equipment and application can be identified.

Criteria 18.92A.2.3

Adjustments performed to control sequence to meet/align to operational requirements and specifications.

Assessor guide: observe that –

Where appropriate, the system is adjusted to ensure that the sequence of operations conforms to operational requirements in accordance with work site procedures.

Assessor guide: confirm that –

The correct operational sequence of the system can be identified. Typical adjustments to correct sequencing variations from specification can be given.

Criteria 18.92A.2.4

Modifications/alterations recorded and reported in accordance with standard operating procedures.

Assessor guide: observe that –

Any modifications/alterations to the system are recorded/reported in accordance with work site procedures.

Assessor guide: confirm that –

The consequences of not recording/reporting modifications to systems can be given. The procedures for recording/reporting modifications/alterations can be identified.

Criteria 18.92A.2.5

Controls operation checked and returned to service to specifications.

Assessor guide: observe that –

The operation of the controls is checked for conformance to specification. The system is returned to service in accordance with work site procedures.

Assessor guide: confirm that –

The operational and control specifications can be identified. The refrigeration/air conditioning system return to service procedures can be identified.

Element 18.92A.3 Fault-find refrigeration/air conditioning control circuits**Criteria 18.92A.3.1**

Control circuit diagrams, data sheets interpreted and understood.

Assessor guide: observe that –

All relevant system/circuit diagrams and data sheets are obtained in accordance with work site procedures.

Assessor guide: confirm that –

The system components and their specifications can be identified.

Criteria 18.92A.3.2

Control circuit components identified and inspected.

Assessor guide: observe that –

The control circuit components are checked/inspected for conformance to specifications.

Assessor guide: confirm that –

Criteria 18.92A.3.3

Control circuit traced and action of components diagnosed to identify and localise faults.

Assessor guide: observe that –

The control circuit components are checked for correct operation in accordance with work site procedures. Components not conforming to operational specification identified and fault localised in accordance with work site procedures.

Assessor guide: confirm that –

Criteria 18.92A.3.4

Control circuit parts tested using appropriate test equipment and application principles.

Assessor guide: observe that –

Appropriate tests are conducted on control circuit parts in accordance with work site procedures.

Assessor guide: confirm that –

Common test equipment and its application can be identified.

Criteria 18.92A.3.5

Control circuit parts assessed against operational specifications.

Assessor guide: observe that –

Control circuit parts are checked for conformance to specifications.

Assessor guide: confirm that –

Criteria 18.92A.3.6 Fault condition localised at the component level.	<i>Assessor guide: observe that –</i> An appropriate corrective action plan is documented in accordance with work site procedures.	<i>Assessor guide: confirm that –</i> The component(s) not complying with operational specification can be identified.
Criteria 18.92A.3.7 Faulty condition evaluated, root cause analysed and corrective action planned.	<i>Assessor guide: observe that –</i> An appropriate corrective action plan is documented in accordance with work site procedures.	<i>Assessor guide: confirm that –</i> Typical causes of component failure can be given. The causes of the faulty condition in the component(s) can be identified. Appropriate procedures for rectifying the faulty condition can be identified.
Element 18.92A.4 Maintain, repair/replace control components		
Criteria 18.92A.4.1 Correct maintenance procedures applied according to standard operating procedures.	<i>Assessor guide: observe that –</i> Appropriate maintenance is carried out in accordance with work site procedures.	<i>Assessor guide: confirm that –</i> The appropriate maintenance schedule and procedures can be identified.
Criteria 18.92A.4.2 Repair procedures selected and applied using correct and appropriate techniques, tools and equipment.	<i>Assessor guide: observe that –</i> Where appropriate, control components repaired in accordance with work site procedures.	<i>Assessor guide: confirm that –</i> Appropriate control component repair procedures can be identified.
Criteria 18.92A.4.3 Faulty items tested, repaired or replaced using sequential installation procedures according to manufacturers' specifications.	<i>Assessor guide: observe that –</i> Faulty items tested for conformance to specification in accordance with work site procedures. Repaired/replaced components installed in accordance with manufacturers' requirements and work site procedures.	<i>Assessor guide: confirm that –</i> Any special installation requirements can be identified. Component and operational specifications can be identified. Typical test equipment and its application can be identified.
Criteria 18.92A.4.4 Replacement items selected from manufacturers' catalogues to meet specification.	<i>Assessor guide: observe that –</i> Where appropriate, replacement items are selected from manufacturers' catalogues in conformance with specifications.	<i>Assessor guide: confirm that –</i>

Criteria 18.92A.4.5

Control components reassembled using appropriate principles and procedures according to specification.

Assessor guide: observe that –

Where appropriate, control components reassembled in accordance with work site procedures.

Assessor guide: confirm that –

Element 18.92A.5 Check and adjust sequence of refrigeration/air conditioning controls**Criteria 18.92A.5.1**

Using circuit diagram and refrigeration/air conditioning system control principles, identify sensors and controllers.

Assessor guide: observe that –

Circuit diagrams are obtained in accordance with work site procedures.

Assessor guide: confirm that –

Circuit sensors and controllers can be identified.

Criteria 18.92A.5.2

Make necessary adjustments to sequence control circuit to meet operational specification.

Assessor guide: observe that –

Where appropriate, the control system is adjusted to ensure conformance to operational specification in accordance with work site procedures.

Assessor guide: confirm that –

The operational requirements/specifications of the system can be identified. Common adjustments that can be made to control systems and their effect can be identified.

Criteria 18.92A.5.3

Correct operation of control circuit checked and confirmed against operational specification.

Assessor guide: observe that –

The operation of the control system is checked for conformance to operational specifications in accordance with work site procedures.

Assessor guide: confirm that –

The correct operation of the control system can be confirmed.

Criteria 18.92A.5.4

Refrigeration/air conditioning controls return to service to specification.

Assessor guide: observe that –

The refrigeration/air conditioning control system is returned to service to specification in accordance with work site procedures.

Assessor guide: confirm that –

The procedures for returning to service commissioning refrigeration/air conditioning control systems can be identified.

Criteria 18.92A.5.5

Appropriate follow-up procedures adopted.

Assessor guide: observe that –

Where appropriate, maintenance and/or service follow-up procedures are initiated in accordance with work site procedures.

Assessor guide: confirm that –

Any maintenance/service follow-up procedures can be identified.

Criteria 18.92A.5.6

Service/maintenance report completed to standard operating procedures.

Assessor guide: observe that –

Maintenance and/or service reports are completed in accordance with work site procedures.

Assessor guide: confirm that –

The maintenance/service recording/reporting requirements can be identified.

Range statement

This unit applies to the repair/replacement of commercial industrial refrigeration and commercial air conditioning controls. Work is carried out autonomously or in a team environment, utilising predetermined standards of safety, quality and workshop procedures. System circuit components identified, traced, inspected and operational function assessed and verified using refrigeration/air conditioning principles to predetermined specifications interpreted from data sheets and circuit diagrams. Installation, adjustment, repairs, replacements and overhauls undertaken to site or manufacturers' specifications, using working and application of principles of domestic refrigeration and/or commercial air conditioning control sequencing which may include: PLC's, relay logic control systems, unitised/modular sensors, transducers, timers, counters and associated equipment. If the skills beyond the sequencing of PLC controls are required, then Unit 10.4A(Enter and change programmable controller operational parameters) and/or Unit 10.5A (Commission programmable controller programs) should also be assessed. Correct operational function of the industrial refrigeration/air handling system controls verified and return to service in conformance to specifications. Where any rectification, modification involves electrical disconnection then Unit 18.49A (Disconnect/reconnect fixed wired equipment up to 1000vAC/1500vDC) should be considered. This unit should not be selected if Unit 18.93B (Maintain and repair integrated refrigeration and/or large handling system controls) has already been selected.

Evidence guide

Assessment context

This unit should be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with refrigeration and air conditioning, or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 18.93B A Maintain and repair integrated industrial refrigeration and/or large air handling system controls

Band – Specialisation band B

Field – Maintenance & diagnostics

Unit Weight 8

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices
18.1A Use hand tools

9.2A Interpret technical drawing
18.2A Use power tools/hand held operations

12.2A Electrical/electronic measurement
18.55A Dismantle, replace and assemble engineering components

18.86A Test, evacuate and charge refrigeration systems

18.90A Maintain and repair industrial refrigeration systems and components

Pre-requisite units - Path 2

2.5C11 Measure with graduated devices
18.1A Use hand tools

9.2A Interpret technical drawing
18.2A Use power tools/hand held operations

12.2A Electrical/electronic measurement
18.55A Dismantle, replace and assemble engineering components

18.86A Test, evacuate and charge refrigeration systems

18.89A Maintain and repair large central air handling systems

Element 18.93B.1 Install/replace refrigeration/air handling system controls

Criteria 18.93B.1.1

Refrigeration/air handling control principles and system diagrams interpreted and understood.

Assessor guide: observe that –

System/circuit diagrams, system operation and control data obtained in accordance with work site procedures.

Assessor guide: confirm that –

The system operational requirements and specifications can be identified. The application of common refrigeration/air handling system components and controllers can be identified.

Criteria 18.93B.1.2

Control system/circuit components identified and inspected for compliance to specifications.

Assessor guide: observe that –

System/circuit components are checked/inspected for compliance to specifications.

Assessor guide: confirm that –

The system/circuit components can be identified.

Criteria 18.93B.1.3

Sequential installation undertaken according to manufacturer's specifications and standard operating procedures.

Assessor guide: observe that –

Specifications addressed and procedures followed during any installation work.

Assessor guide: confirm that –

The importance of following installation procedures can be explained in terms of control operation, safety and reliability.

Element 18.93B.2 Check and adjust refrigeration/air handling system control sequence and operation**Criteria 18.93B.2.1**

The temperature, quality, pressure and properties of the air delivered by the air handling system is checked for conformance to specification.

Assessor guide: observe that –

Appropriate measuring equipment selected and used to check that the temperature, flow and quality of the conditioned air conforms to specification. Appropriate measuring instruments/equipment selected and used to check that the air properties conform to specification. All non conforming measurements are correctly identified.

Assessor guide: confirm that –

The appropriate measuring instruments/equipment for checking air temperatures, air flows, air quality and air properties can be identified. The appropriate specifications required for checking air temperatures, air flows, air quality and air properties can be identified. The procedures for reporting non conformances can be given. The air properties controlled by the air conditioning system can be identified.

Criteria 18.93B.2.2

Controls and system operation checked against operational specifications using appropriate test equipment and application principles/techniques.

Assessor guide: observe that –

Appropriate test equipment is used to check control and system operation against specifications in accordance with work site procedures.

Assessor guide: confirm that –

Refrigeration/air conditioning test equipment and application can be identified.

Criteria 18.93B.2.3

Adjustments performed to sequence system to meet/align to operational requirements and specifications.

Assessor guide: observe that –

Where appropriate, the system is adjusted to ensure that the sequence of operations conforms to operational requirements in accordance with work site procedures.

Assessor guide: confirm that –

The correct operational sequence of the system can be identified. Typical adjustments to correct sequencing variations from specification can be given.

Criteria 18.93B.2.4

Modifications/alterations recorded and reported in accordance with standard operating procedures.

Assessor guide: observe that –

Any modifications/alterations to the system are recorded/reported in accordance with work site procedures.

Assessor guide: confirm that –

The consequences of not recording/reporting modifications to systems can be given. The procedures for recording/reporting modifications/alterations can be identified.

Criteria 18.93B.2.5

Controls and system operation checked and commissioned to specifications.

Assessor guide: observe that –

The operation of the controls is checked for conformance to specification. The system is returned to service in accordance with work site procedures.

Assessor guide: confirm that –

The operational and control specifications can be identified. The refrigeration/air handling system return to service procedures can be identified.

Element 18.93B.3 Fault-find refrigeration/air handling system control circuits**Criteria 18.93B.3.1**

Control system/circuit diagrams, data sheets interpreted and understood.

Assessor guide: observe that –

All relevant system/circuit diagrams and data sheets are obtained in accordance with work site procedures.

Assessor guide: confirm that –

The system components and their specifications can be identified.

Criteria 18.93B.3.2

Control system/circuit components identified and inspected.

Assessor guide: observe that –

The control circuit components are checked/inspected for conformance to specifications.

Assessor guide: confirm that –

Criteria 18.93B.3.3

Control system/circuit traced and action of components diagnosed to identify and localise faults.

Assessor guide: observe that –

The control circuit components are checked for correct operation in accordance with work site procedures. Components not conforming to operational specification identified and fault localised in accordance with work site procedures.

Assessor guide: confirm that –

Criteria 18.93B.3.4

Control system/circuit parts tested using appropriate test equipment and application principles.

Assessor guide: observe that –

Appropriate tests are conducted on control circuit parts in accordance with work site procedures.

Assessor guide: confirm that –

Common test equipment and its application can be identified.

Criteria 18.93B.3.5

Control system/circuit parts assessed against operational specification.

Assessor guide: observe that –

Control circuit parts are checked for conformance to specifications.

Assessor guide: confirm that –

Criteria 18.93B.3.6

Fault condition localised at the component level.

Assessor guide: observe that –

Assessor guide: confirm that –

The component(s) not complying with operational specification can be identified.

Criteria 18.93B.3.7

Faulty condition evaluated, root cause analysed and corrective action planned.

Assessor guide: observe that –

An appropriate corrective action plan is documented in accordance with work site procedures.

Assessor guide: confirm that –

Typical causes of component failure can be given. The causes of the faulty condition in the component(s) can be identified. Appropriate procedures for rectifying the faulty condition can be identified.

Element 18.93B.4 Maintain, repair/replace system control components**Criteria 18.93B.4.1**

Correct maintenance procedures applied according to standard operating procedures.

Assessor guide: observe that –

Appropriate maintenance is carried out in accordance with work site procedures.

Assessor guide: confirm that –

The appropriate maintenance schedule and procedures can be identified.

Criteria 18.93B.4.2

Repair procedures selected and applied using correct and appropriate techniques, tools and equipment.

Assessor guide: observe that –

Where appropriate, control components repaired in accordance with work site procedures.

Assessor guide: confirm that –

Appropriate control component repair procedures can be identified.

Criteria 18.93B.4.3

Faulty items tested, repaired or replaced using sequential installation procedures according to manufacturer's specifications.

Assessor guide: observe that –

Faulty items tested for conformance to specification in accordance with work site procedures. Repaired/replaced components installed in accordance with manufacturers' requirements and work site procedures.

Assessor guide: confirm that –

Any special installation requirements can be identified. Component and operational specifications can be identified. Typical test equipment and its application can be identified.

Criteria 18.93B.4.4

Replacement items selected from manufacturer's catalogues to meet specifications.

Assessor guide: observe that –

Where appropriate, replacement items are selected from manufacturers' catalogues in conformance with specifications.

Assessor guide: confirm that –

Criteria 18.93B.4.5

System control components reassembled using appropriate principles and procedures according to specification.

Assessor guide: observe that –

Where appropriate, control components reassembled in accordance with work site procedures.

Assessor guide: confirm that –

Element 18.93B.5 Check and adjust sequence of refrigeration/air handling system controls**Criteria 18.93B.5.1**

Using circuit diagram and refrigeration/air handling system control principles, identify circuit sensors and controllers.

Assessor guide: observe that –

Circuit diagrams are obtained in accordance with work site procedures.

Assessor guide: confirm that –

Circuit sensors and controllers can be identified.

Criteria 18.93B.5.2

Make necessary adjustments to sequence system control circuit to meet operational specification.

Assessor guide: observe that –

Where appropriate, the control system is adjusted to ensure conformance to operational specification in accordance with work site procedures.

Assessor guide: confirm that –

The operational requirements/specifications of the system can be identified. Common adjustments that can be made to control systems and their effect can be identified.

Criteria 18.93B.5.3

Correct operation of system control circuit checked and confirmed against operational specification.

Assessor guide: observe that –

The operation of the control system is checked for conformance to operational specifications in accordance with work site procedures.

Assessor guide: confirm that –

The correct operation of the control system can be confirmed.

Criteria 18.93B.5.4

Refrigeration/air handling system controls commissioned to specification.

Assessor guide: observe that –

The refrigeration/air handling control system is returned to service to specification in accordance with work site procedures.

Assessor guide: confirm that –

The procedures for returning to service commissioning refrigeration/air handling control systems can be identified.

Criteria 18.93B.5.5

Appropriate follow-up procedures adopted.

Assessor guide: observe that –

Where appropriate, maintenance and/or service follow-up procedures are initiated in accordance with work site procedures.

Assessor guide: confirm that –

Any maintenance/service follow-up procedures can be identified.

Criteria 18.93B.5.6

Service/maintenance report completed to standard operating procedures.

Assessor guide: observe that –

Maintenance and/or service reports are completed in accordance with work site procedures.

Assessor guide: confirm that –

The maintenance/service recording/reporting requirements can be identified.

Range statement

This unit applies to the repair/replacement of integrated industrial refrigeration and air handling systems controls. Work is carried out autonomously or in a team environment. Utilising predetermined standards of safety, quality and workshop procedures. System circuit components identified, traced, inspected and operational function assessed and verified using refrigeration/air conditioning principles to predetermined specifications interpreted for data sheets and circuit diagrams. Installation, adjustment, repairs, replacements and overhauls undertaken to site or manufacturers specification, using working and application of principles of industrial refrigeration and/or air handling systems control sequencing which may include: PLC's relay logic control systems, unitised/modular sensors, transducers, timers, counters and associated equipment. If the skills beyond the sequencing of PLC controls are required. Then Unit 10.4A (Enter and change programmable controller operational parameters) and/or Unit 10.5A (Commission programmable controller programs) should also be assessed. Correct operational function of the industrial refrigeration/air handling system controls verified and commissioned in conformance to specifications. Where any rectification, modification involves electrical disconnection and reconnection, then Unit 18.49A (Disconnect/reconnect fixed wired equipment up to 1000vAC/1500vDC) should also be considered.

Evidence guide

Assessment context

This unit should be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with precision mechanical measurements or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 18.94A A Service and repair of commercial refrigeration

Band – Specialisation band A

Field – Maintenance & diagnostics

Unit Weight 6

Pre-requisite units - Path 1

12.2A Electrical/electronic measurement

18.1A Use hand tools

18.2A Use power tools/hand held operations

18.55A Dismantle, replace and assemble engineering components

18.86A Test, evacuate and charge refrigeration systems

Element 18.94A.1 Undertake preventive maintenance checks/adjustment on commercial refrigeration equipment

Criteria 18.94A.1.1

Visual inspection and testing with appropriate test equipment is carried out according to refrigeration principles, procedures and safety requirements.

Assessor guide: observe that –

Testing is carried out to accepted standards in a safe manner.

Assessor guide: confirm that –

Correct test procedures can be identified and described.

Criteria 18.94A.1.2

Preventative maintenance tasks as performed according to manufacturer's specifications using refrigeration techniques and practices.

Assessor guide: observe that –

All work is carried out to accepted standards and to specifications where applicable.

Assessor guide: confirm that –

Frequency and reason for preventative maintenance is explained.

Element 18.94A.2 Undertake fault finding on commercial refrigeration equipment

Criteria 18.94A.2.1

Equipment components identified correctly.

Assessor guide: observe that –

Components on a range of equipment can be accurately identified.

Assessor guide: confirm that –

Variations in component identities can be explained

Criteria 18.94A.2.2

The characteristics and operation of each component is understood.

Assessor guide: observe that –

Assessor guide: confirm that –

Operation and characteristics of range if components can be described

Criteria 18.94A.2.3

The operational function of each component is inspected and tested.

Assessor guide: observe that –

All refrigeration system components are checked for correct operation using appropriate tools, techniques and equipment in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for checking refrigeration components for correct operation can be given. The tools, techniques and equipment necessary to check refrigeration system components for correct operation can be identified.

Criteria 18.94A.2.4

Correct operation of each component assessed against specification.

Assessor guide: observe that –

Component performance/operation is compared against specification.

Assessor guide: confirm that –

Specifications are obtained, interpreted and understood.

Element 18.94A.3 Repair/replace commercial refrigeration components**Criteria 18.94A.3.1**

Faulty components are localised and malfunction confirmed by inspection and testing using refrigeration principles, procedures and safety requirements.

Assessor guide: observe that –

Where appropriate, faulty components are identified for repair or replacement.

Assessor guide: confirm that –

The procedures for identifying components for repair or replacement can be given.

Criteria 18.94A.3.2

The refrigerant is removed safely from the system and contained in accordance with standard operating procedures and regulatory requirements where appropriate.

Assessor guide: observe that –

The refrigerant is evacuated and contained in a safe and appropriate manner, meeting all necessary requirements.

Assessor guide: confirm that –

Evacuation, containment and storage procedures can be identified and explained.

Criteria 18.94A.3.3

Faulty components are dismantled and repaired to manufacturer's specifications as required.

Assessor guide: observe that –

Repairs are undertaken in a safe and reliable manner using correct techniques and accepted practices.

Assessor guide: confirm that –

The effect of poor repair practices can be described.

Criteria 18.94A.3.4

Replacement parts selected from manufacturer's catalogues according to required specifications.

Assessor guide: observe that –

Relevant catalogues/lists are used particularly when catalogues, etc., are not available.

Assessor guide: confirm that –

Process to select replacement parts can be described.

Element 18.94A.4 Return to service commercial refrigeration equipment**Criteria 18.94A.4.1**

Components are reassembled and tested for correct operation and assessed against specification.

Assessor guide: observe that –

Assembly and testing procedures are followed correctly and thoroughly.

Assessor guide: confirm that –

Assembly and testing procedures can be identified and explained.

Criteria 18.94A.4.2

Using domestic refrigeration principles and system application techniques, correct operation of the equipment is verified.

Assessor guide: observe that –

The temperatures, flows, pressures, air properties and noise/vibration levels achieved as a result of the adjustments made are recorded/reported in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for adjusting refrigeration systems for correct operation in accordance with specifications can be given.

Criteria 18.94A.4.3

Maintenance records/service reports completed by appropriate designated means.

Assessor guide: observe that –

Where appropriate, authorised out-of-specification adjustments are recorded in accordance with standard operating procedures.

Assessor guide: confirm that –

The procedures for obtaining authorisation of adjustments outside of operational specifications can be given. The person(s) responsible for authorising adjustments outside of specifications can be identified. The reasons adjustments outside of specification may be made can be given. The tools, techniques and equipment required to adjust the refrigeration system to specification can be identified.

Range statement

This unit applies to servicing and repairing commercial and supermarket refrigeration equipment and components. Work is carried out autonomously or in a team environment. Interpret drawings and diagrams of refrigeration equipment, and utilise basic fault finding procedures, service manifolds, and test equipment to identify and diagnose faults in equipment; and isolate faulty components including control components and rectify common faults. They are able to retro fit existing commercial refrigeration equipment with alternative refrigerants, recondition components, return to service and test equipment, and complete service reports for administrative action. Where any rectification, modification involves electrical disconnection and reconnection, then Unit 18.49A (Disconnect/reconnect fixed wired equipment up to 1000v AC and 1500v DC) should also be considered. When there is a requirement to remove and replace components by brazing and or silver soldering Unit 5.6A (Perform brazing and/or silver soldering) should also be accessed. Where detailed maintenance is carried out on control systems, Unit 18.57A (Maintain/service analog/digital electronic equipment) should also be selected.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with refrigeration units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference manuals. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable time frames relating to typical workplace activities.

Unit MEM 19.1A A Jewellery metal casting

Band – Specialisation band A

Field – Jewellery & horological

Unit Weight 6

Pre-requisite units - Path 1

13.4A Work safely with molten metals/glass

Element 19.1A.1 Prepare metals for casting

Criteria 19.1A.1.1

Metals and alloys selected in appropriate proportions.

Assessor guide: observe that –

Jewellery metals and alloys are identified for given job
Correct proportions/quantity of metals selected for appropriate alloys.

Assessor guide: confirm that –

Procedures for identifying jewellery metals and alloys can be given. Procedures for calculating proportions/quantities of alloys can be given for jewellery metals. Properties of jewellery metals in relation to casting are understood.

Criteria 19.1A.1.2

Metals/alloys are weighed out correctly.

Assessor guide: observe that –

Metals/alloys are weighed out in correct proportions/sequence according to standard procedures.

Assessor guide: confirm that –

Procedures for weighing out metals/alloys in correct proportions/sequence can be given.

Criteria 19.1A.1.3

Relevant data is recorded.

Assessor guide: observe that –

All applicable data is recorded according to standard operating procedure.

Assessor guide: confirm that –

Procedures for recording all data can be given and accessed as reference material.

Element 19.1A.2 Conduct pre-casting operations

Criteria 19.1A.2.1

Equipment is prepared according to standard operation procedure.

Assessor guide: observe that –

Equipment is balanced/set according to standard operating procedures.

Assessor guide: confirm that –

Procedures for preparing equipment at all process stages can be identified. Results of poor work practices can be given.

Criteria 19.1A.2.2

Inert gas supply/delivery and vacuum systems checked, if applicable.

Assessor guide: observe that –

Inert gas supply/delivery, vacuum systems, and graphite/silicone seals checked, checked according to standard operating procedure and manufacturers specifications.

Assessor guide: confirm that –

The procedures for checking and maintaining inert gas supply/delivery seals and vacuum systems can be given.

Criteria 19.1A.2.3

Preheating/glazing carried out if applicable.

Assessor guide: observe that –

Crucible pre-heated/glazed and thermocouple/heat register/control device tested, if applicable. All systems/devices checked according to standard operating procedure and manufacturer specifications.

Assessor guide: confirm that –

Procedures for pre-heating/glazing of melting crucible and testing of heat register/control device can be given.

Criteria 19.1A.2.4

Temperature of invested flask is maintained.

Assessor guide: observe that –

Invested flask maintained at appropriate temperature after burn out.

Assessor guide: confirm that –

Procedures for maintaining flask temp can be identified for various situations and flask combinations.

Element 19.1A.3 Melt jewellery metal**Criteria 19.1A.3.1**

Protective coating applied to jewellery metal as appropriate.

Assessor guide: observe that –

Appropriate coating is applied in accordance with standard operating procedures.

Assessor guide: confirm that –

Procedures for applying protective coating to jewellery metal can be identified, and reasons for its use can be given.

Criteria 19.1A.3.2

Jewellery metal is heated.

Assessor guide: observe that –

Metal is heated by appropriate means, following standard operating procedures/equipment manuals.

Assessor guide: confirm that –

Procedures for heating jewellery metals of various qualities and quantities can be identified.

Criteria 19.1A.3.3

Jewellery metal casting temperature is achieved.

Assessor guide: observe that –

Metal is raised to casting temperature in accordance standard operating procedures, and Occupational Health and Safety requirements.

Assessor guide: confirm that –

Procedures for achieving casting temperatures can be identified for a range of metals.

Element 19.1A.4 Cast metals**Criteria 19.1A.4.1**

Burn-out flask is positioned correctly.

Assessor guide: observe that –

Burn-out flask is placed safely in casting position in accordance with standard operating procedure.

Assessor guide: confirm that –

Procedures for safe and secure placement of burn-out flasks in the casting position can be given for different size flasks.

Criteria 19.1A.4.2

Molten metal tapped following.

Assessor guide: observe that –

Metal is poured/dropped/released in accordance with standard operating procedures. Safe and accurate flow of molten metal is ensured.

Assessor guide: confirm that –

Molten jewellery metal status and properties can be given Relevant Occupational Health and Safety issues can be explained.

Criteria 19.1A.4.3

Allowance made for adequate solidification time.

Assessor guide: observe that –

Appropriate time frame observed for solidification in accordance with standard operating procedure.

Assessor guide: confirm that –

The processes for confirming stabilisation and solidification of jewellery metals can be given for various flask sizes and applications.

Criteria 19.1A.4.4

Furnace is operated in accordance with work site procedures.

Assessor guide: observe that –

Furnace is started, monitored and shut down in accordance with work site procedures and occupational health and safety requirements and regulations.

Assessor guide: confirm that –

Furnace start up and shut down procedures can be given. Optimum operating temperatures can be given. Safety clothing/apparatus and their applications can be identified. Hazards associated with feeding and removing materials can be identified. Hazard prevention and emergency procedures can be given.

Element 19.1A.5 Perform post-casting operations**Criteria 19.1A.5.1**

Casting flask removed and stored in a safe manner.

Assessor guide: observe that –

Flask is safely removed and stored in accordance with standard operating procedure.

Assessor guide: confirm that –

The procedures for safe handling and storage of casting flask can be identified. The results of inappropriate action at this stage can be given.

Criteria 19.1A.5.2

Casting materials/consumables cleaned/stored/disposed as appropriate.

Assessor guide: observe that –

Investment materials removed, trees cleaned, and cleaning agents are stored and/or disposed of following safety precautions/Occupational Health and Safety requirements and in standard operating procedure.

Assessor guide: confirm that –

Procedures for the safe handling and storage of all materials can be demonstrated, and the hazards/precautions can be explained in each case.

Criteria 19.1A.5.3

Work area and equipment maintained.

Assessor guide: observe that –

Work area and equipment cleaned of investment, chemicals and cleaning agent residue.

Assessor guide: confirm that –

Procedures for appropriate cleaning work areas and equipment can be given and the consequences of poor standards can be explained.

Range statement

This unit covers jewellery metal casting, primarily by the 'lost wax' method of investment casting, but may include cuttlebone and sand processes as extensions. All work undertaken autonomously or within a team environment using predetermined specifications and standards of quality, safety. Casting metals may include gold, platinum, palladium, silver, copper, and their alloys. Processes include centrifugal and vacuum assist. Heating methods may include resistance/induction coils, and hand held torches fuelled by a variety of combinations of gas/propane/acetylene/air/oxygen. Protective coatings may include fluxes and inert gases.

Evidence guide

Assessment context

This unit should be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. Evidence for assessment should be accompanied by appropriate evidence that supports the gaining of underpinning knowledge.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the "lost wax" casting process or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 19.2A A Prepare jewellery illustrations

Band – Specialisation band A

Field – Jewellery & horological

Unit Weight 4

Pre-requisite units - Path 1

9.1A Draw and interpret sketch

Element 19.2A.1 Identify illustration requirements

Criteria 19.2A.1.1

Requirements and purpose of illustration determined from customer and/or work instructions and associated documents.

Assessor guide: observe that –

Customer and/or work instructions and associated documents interpreted and illustration requirements determined. Sufficient information is obtained to determine customer requirements.

Assessor guide: confirm that –

Common work specifications and documents relating to work instruction can be identified. Various sources of information can be identified.

Criteria 19.2A.1.2

Required data identified and collected.

Assessor guide: observe that –

All data necessary to produce the drawing is identified and collected. Data is collected for emphasis and priority according to illustration requirements and is identified, collected and collated to match required outcomes.

Assessor guide: confirm that –

Data for producing illustrations can be given.

Criteria 19.2A.1.3

Appropriate equipment is selected.

Assessor guide: observe that –

Equipment is appropriate to the illustrating method chosen and requirements. Equipment is checked, maintained and stored according to standards operating procedure.

Assessor guide: confirm that –

Equipment can be identified and uses given. Storage and maintenance requirements of equipment can be given. The working parameters of the selected equipment can be given.

Element 19.2A.2 Prepare or modify drawing

Criteria 19.2A.2.1

Illustrations are consistent with enterprise standard operating procedures.

Assessor guide: observe that –

Illustrations are produced/modified/supplied according to standards operating procedures. Illustrations comply with stated requirements and are appropriate for practical application.

Assessor guide: confirm that –

Jewellery metal/fabrication for preparation of the illustration is understood. The key aspects of the illustration can be identified. Working properties of jewellery metals used in practical manufacturing applications can be identified. Communication of construction, polishing and stone setting as through illustration is understood.

Criteria 19.2A.2.2

Illustration is rendered if applicable.

Assessor guide: observe that –

Rendering requirements are identified. Illustration is rendered to specification. Colour, contour, shadow/highlight techniques are used for emphasis to display jewellery design concept.

Assessor guide: confirm that –

Rendering process is understood. Techniques and tools for the creation of illustration effects can be given.

Criteria 19.2A.2.3

Illustration and accompanying documentation approved in accordance with standard operating procedures.

Assessor guide: observe that –

Completed drawing and all accompanying specifications are checked/approved in accordance with standard operating procedures. Modifications/corrections undertaken to ensure conformance to specifications.

Assessor guide: confirm that –

Procedure for approving illustrations can be given. Appropriate authority for confirming data/specifications/illustration can be identified.

Element 19.2A.3 Filing/storage of illustration

Criteria 19.2A.3.1

Working and reference drawings/illustrations are used/stored/filed/copied/issued in accordance with standard operating procedures.

Assessor guide: observe that –

Recording/storage and retrieval systems are used in accordance with standard operating procedures.

Assessor guide: confirm that –

Appropriate methods for storage and retrieval can be identified. Systems usage procedures can be given.

Range statement

This unit applies to manual and electronic procedures and equipment. Where a CAD system is used, the appropriate units should also be selected. Where interpersonal and customer/client service skills are required, the appropriate units should be considered. Where computerised storage and retrieval systems are used Unit 2.9C10 (Perform computer operations) should also be selected. Specifications may be obtained from design information, customer ideas/concepts/expectations/requirements, sketches, preliminary layouts.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. Assessment should be conducted in an environment that the individual is familiar with.

Critical aspects

Competency in this unit requires the production of a jewellery illustration that will ensure practical application of the elements of construction and metal properties resulting in an item faithful to the original design concept/specifications. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with preparing jewellery illustrations or other units requiring the exercise of the skills and knowledge covered by this unit.

Knowledge and experience in construction and polishing techniques are considered essential in order to achieve competency in this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 19.3A A Handle gem materials (basic)

Band – Specialisation band A

Field – Jewellery & horological

Unit Weight 2

Element 19.3A.1 Handle gem materials

Criteria 19.3A.1.1

Working area set out in accordance with standard operating procedure.

Assessor guide: observe that –

Gemstone observation area is prepared according to standard operating procedure.

Assessor guide: confirm that –

Requirements for setting up appropriate gem observation area can be identified.

Criteria 19.3A.1.2

Appropriate tools selected to observe material.

Assessor guide: observe that –

Appropriate observation tools/equipment selected according to standard operating procedure.

Assessor guide: confirm that –

Tools and equipment for observing the properties/condition of materials can be identified and their uses given. Function and limitations of selected equipment can be given.

Criteria 19.3A.1.3

Observation carried out according to standard operating procedure.

Assessor guide: observe that –

Tools/equipment and materials are used according to standard operating procedure, occupational health and safety and manufacturers specifications.

Assessor guide: confirm that –

Techniques/observations that may be used/made with selected tools can be given.

Criteria 19.3A.1.4

Correct handling procedure is identified.

Assessor guide: observe that –

Gem materials are handled in accordance with the condition and properties identified.

Assessor guide: confirm that –

Specific handling procedures and measures for different gem materials can be given.

Element 19.3A.2 Record and compare general observations**Criteria 19.3A.2.1**

Techniques and results are recorded.

Assessor guide: observe that –

Standard recording processes are followed All appropriate information is recorded.

Assessor guide: confirm that –

Recording processes can be identified. The type of information to be recorded can be identified. The reasons why information is relevant can be given.

Criteria 19.3A.2.2

Results are interpreted.

Assessor guide: observe that –

Results are collated and compared with reference documentation charts/lists/graphs/diagrams, and all other control material. Reference materials are used according to workshop practice. Results are collated according to standard operating procedures.

Assessor guide: confirm that –

Location of reference materials can be identified. Application of knowledge gained from resource/observations can be applied to reach a conclusion.

Range statement

This unit covers the skills and knowledge for basic handling and observation of gem materials, where the application of skills and knowledge may not be part of a designated gemmological work environment. Observations are primarily aimed at recognition of the properties of gem materials that may affect the way in which they are to be handled in the workplace. Included in this unit is a basic understanding of gemology and gemstone types (including diamonds), nomenclature relative to gemstones and diamonds and the use of the basic equipment required to observe the condition and features of gemstones. The basic equipment includes, but is not limited to, tweezers and 10x loupe. The range of gemstones includes selections of all the major gemstone materials as well as composite, synthetic and imitation gemstones. All work undertaken autonomously or within a team environment using predetermined specifications and standards of quality, safety.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. Assessment should be conducted in an environment that the individual is familiar with.

Critical aspects

The underpinning knowledge required to complete this competency will cover common workplace handling and storage of gemstone materials. All knowledge must be applied to practical applications such as parcel wear, reaction to heat, liquids, applied abrasive actions and ultra-sonic cleaning effects. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with basic gemstone handling or other units requiring the exercise of the skills and knowledge covered by this unit. Knowledge and experience in construction and polishing techniques are considered essential in order to achieve competency in this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 19.4A A Handle and examine gemstone materials

Band – Specialisation band A

Field – Jewellery & horological

Unit Weight 6

Pre-requisite units - Path 1

19.3A Handle gem materials (basic)

Element 19.4A.1 Prepare equipment for gemstone examination

Criteria 19.4A.1.1

Appropriate examination methods and equipment selected.

Assessor guide: observe that –

Appropriate procedures and equipment are selected for examination of gem materials.

Assessor guide: confirm that –

Different methods for examination of gem materials in relation to the properties and features that may affect specific materials during jewellery manufacture, repair or alteration can be given. Equipment required for examination and the function of each can be given.

Criteria 19.4A.1.2

Equipment and specimen/s prepared.

Assessor guide: observe that –

Equipment is prepared, pre-set, balanced, calibrated, levelled according to supplier/manufacturer specifications. Specimen is cleaned according to workplace procedures.

Assessor guide: confirm that –

Limitations of the selected equipment/methods can be given. Standard operating procedures and supplier/manufacturer specifications are understood.

Element 19.4A.2 Perform gemstone examinations

Criteria 19.4A.2.1

Physical and optical properties of gem materials are observed.

Assessor guide: observe that –

Equipment is used according to manuals and standard operating procedures. All work is performed in accordance with standard operating procedures and OH&S. All relevant physical and optical properties of gemstone are identified.

Assessor guide: confirm that –

The procedures for correct use of the selected equipment can be given. Definitions of processes and features can be given. Physical and optical properties of relevant gemstones can be given. The requirements for occupational health and safety can be identified. The effects of inadequate housekeeping and workplace procedures can be given.

Criteria 19.4A.2.2

Results recorded and verified.

Assessor guide: observe that –

Results are recorded and compared with known control items/charts/lists/graphs/diagrams and resource materials
Outcomes are verified.

Assessor guide: confirm that –

The process for verifying results can be given. Resource materials can be identified and accessed.

Element 19.4A.3 Handle gem materials**Criteria 19.4A.3.1**

Appropriate handling measures are identified.

Assessor guide: observe that –

Appropriate handling measures and precautions are selected in relation to given gem materials, work processes and tools/equipment.

Assessor guide: confirm that –

Handling measures and precautions for specific gem materials during jewellery manufacture, repair or alteration can be given.

Criteria 19.4A.3.2

Gem materials are handled to minimise risk of damage.

Assessor guide: observe that –

Selected handling measures and precautions are applied correctly during given jobs.

Assessor guide: confirm that –

Specific handling measures and precautions used during given jobs can be explained.

Element 19.4A.4 Investigate and report examination results**Criteria 19.4A.4.1**

Examination results prepared and recorded.

Assessor guide: observe that –

Format/documentation of results is prepared according to standard operating procedures. Results are interpreted and findings verified by independent source, where required. Sufficient evidence to support conclusions is presented.

Assessor guide: confirm that –

Evidence used in support of conclusions can be explained Terminology definitions can be given. Limitations/errors in process/methods can be identified. Sources of independent verification can be given.

Range statement

This unit covers the knowledge and skills required to handle specific gem materials during jewellery manufacture, repair or alteration, through defining the properties and condition of gem materials (including diamonds) that may affect handling in the workplace. The unit primarily aims at minimising the risk of damage to gem materials during jewellery manufacturing, alteration, and repair processes, through gaining a familiarity and understanding of the physical and chemical properties of natural, composite, synthetic, imitation and treated gem materials. It applies to an individual working autonomously and guided by strict rules of procedure. Emphasis to be placed on knowledge of the principles of gemology, gemstone and diamond nomenclature, gemstone processing enhancement and repair, and appreciation of gemstone qualities. Equipment would include 10x loupe, tweezers and thermal probes. The range of gem materials would include all natural, synthetic, treated, composite and imitation gem materials that may reasonably be expected to be encountered in the workplace. Note: the competencies covered by this unit do not include the requirement to perform accurate and positive gemstone identifications.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team.

Assessment should be conducted in an environment that the individual is familiar with.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with gemstone handling and examination or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 19.5A A Produce three-dimensional precision items

Band – Specialisation band A

Field – Jewellery & horological

Unit Weight 8

Pre-requisite units - Path 1

13.3A Work safely with industrial chemicals and materials

13.4A Work safely with molten metals/glass

18.1A Use hand tools

18.2A Use power tools/hand held operations

18.3A Use tools for precision work

Element 19.5A.1 Determine item requirements

Criteria 19.5A.1.1

Item production information identified.

Assessor guide: observe that –

Specifications and drawings interpreted and data collected and assessed for practical applications according to standard operating procedures.

Assessor guide: confirm that –

Location of information/specifications can be identified. Clarification/approval processes can be given. Drawings/illustrations/specifications are understood.

Criteria 19.5A.1.2

Process/technique selected for production of item.

Assessor guide: observe that –

Appropriate methods are selected for format requirements according to standard operating procedure.

Assessor guide: confirm that –

Wrought, forge, machine and cast techniques are understood. The appropriate application for each can be identified.

Criteria 19.5A.1.3

Item material/s selected.

Assessor guide: observe that –

Materials are selected according to standard operating procedures and item specifications.

Assessor guide: confirm that –

The appropriate properties/function of materials can be identified. All pre-requisite working specifications/abilities/limitations of selected materials are understood. Stored data on specifications and processes can be accessed.

Criteria 19.5A.1.4

Appropriate tools, equipment and processes selected.

Assessor guide: observe that –

Tools/equipment/processes are selected according to the format requirements, and standard operating procedures.

Assessor guide: confirm that –

Knowledge of tools and equipment is matched correctly to processes, and fundamental variations are understood.

Element 19.5A.2 Produce one-off design/item**Criteria 19.5A.2.1**

Construction plan developed to meet specifications/stages of process.

Assessor guide: observe that –

Working knowledge of metals and materials is applied in the construction of the plan.

Assessor guide: confirm that –

Planning/process stages can be identified. Integrated working knowledge of different mediums can be given.

Criteria 19.5A.2.2

Item components are prepared using appropriate techniques/procedures.

Assessor guide: observe that –

Materials are marked out and/or using acceptable techniques, procedures. Item/components pre-formed/produced to size and shape. Appropriate tools and equipment are utilised. Work is checked for compliance to known specifications.

Assessor guide: confirm that –

Fine detail work processes can be given OH&S issues are understood. Various components of jewellery items can be identified.

Criteria 19.5A.2.3

Design/item produced/assembled.

Assessor guide: observe that –

All work is undertaken according to standard operating procedures and OH&S procedures. Product is produced/assembled to specification.

Assessor guide: confirm that –

Levels of acceptable performance and productivity outcomes can be identified.

Element 19.5A.3 Finish and inspect work**Criteria 19.5A.3.1**

Item checked for compliance with specifications.

Assessor guide: observe that –

Product is matched to original design concept/drawings/specifications. Surface condition inspected for conformance to specification and appropriateness for post-production processing, if applicable.

Assessor guide: confirm that –

Inspection and compliance checks can be identified. Surface/parts can be assessed as appropriate for post-production processes if required, e.g. setting, electroplating, etc.

Criteria 19.5A.3.2

Product data is recorded.

Assessor guide: observe that –

Specifications, including weights and measurements are recorded according to standard operating procedures.

Assessor guide: confirm that –

Reasons for the recording of specifications can be given. Appropriate measuring devices and recording methods can be identified.

Criteria 19.5A.3.3

Final finish and storage procedures applied.

Assessor guide: observe that –

Final treatments are undertaken according to standard operating procedures and occupational health and safety procedures. Handling and storage of item conducted according to workplace requirements. Items polished using appropriate techniques.

Assessor guide: confirm that –

Knowledge of the finishing process can be given. Procedures for final treatment/safe handling and storage of items are understood. Reasons why tools, equipment, resources and reference material are stored in accordance with operating procedures and occupational health and safety procedures can be given.

Range statement

This unit covers the production of one-off three-dimensional precision jewellery items including rings, pendants, brooches, earrings, bracelets and other decorative pieces from metals common to industry practice. Work undertaken autonomously or within a team environment using predetermined standards of quality, safety, workplace procedures and accepted workplace techniques/methods. Documentation and manuals may include drawings/illustrations, customer verbal/written specifications. Work is mainly by the hand-held application of processes and techniques. Tools & equipment include hand-held power tools, saws, files, drills, punch plates, pliers. Where lathes are used, Unit 7.5 (Perform general machining) should also be selected. Where soldering is required Unit 5.6A (Perform brazing/soldering) should also be selected. Production of three-dimensional precision jewellery masters is covered by Unit 19.13A (Prepare jewellery metal masters).

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. Assessment should be conducted in an environment that the individual is familiar with.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with producing three dimensional precision jewellery items or other units requiring the exercise of the skills and knowledge covered by this unit. Knowledge and experience in construction and polishing techniques are considered essential in order to achieve competency in this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 19.6A A Watch battery replacement

Band – Specialisation band A

Field – Jewellery & horological

Unit Weight 1

Pre-requisite units - Path 1

18.1A Use hand tools

Element 19.6A.1 Identify watch case construction

Criteria 19.6A.1.1

Case material and construction identified.

Assessor guide: observe that –

Case and adjustment parts are handled safely Watch status is clarified.

Assessor guide: confirm that –

Horological terminology for common case parts can be given. Case requirement for battery can be identified. Design of case types and their functions can be grouped appropriately.

Criteria 19.6A.1.2

Case types and their functions are identified.

Assessor guide: observe that –

Design of case types and their functions can be grouped appropriately.

Assessor guide: confirm that –

Different case types and their functions can be given.

Criteria 19.6A.1.3

Associated parts and consumables identified.

Assessor guide: observe that –

Preliminary inspection confirms power cell requirement. Glass, crown and pushers are inspected for obvious damage/wear and/or moisture intrusion.

Assessor guide: confirm that –

Relevant case/watch parts can be identified. Water resistant, dustproof and diver's cases can be identified. Analog, digital, multi-function and mechanicals can be identified. Watch functions can be explained. Wear and the possible effects on glass and adjusters can be given. Procedures to confirm power cell status can be given.

Element 19.6A.2 Open and close watches**Criteria 19.6A.2.1**

Workshop tools and equipment selected and used appropriately.

Assessor guide: observe that –

The workplace set-up for battery replacement is in accordance with industry requirements and standard operating procedures. Tools for watch case open/close procedures are selected according to standard operating procedures.

Assessor guide: confirm that –

The watch-specific tools and equipment can be identified for a range of functions related to watch battery fitting and checking.

Criteria 19.6A.2.2

Watch cases are opened and closed correctly.

Assessor guide: observe that –

Opening and closing procedures are undertaken in accordance with standard operating procedures and OH&S.

Assessor guide: confirm that –

Seals, gaskets, threads and seating areas can be identified and condition recognised. Opening and closing procedures for various case types can be given.

Criteria 19.6A.2.4

Parts inspected and results reported and/or recorded.

Assessor guide: observe that –

Inspection of case parts conducted according to standard operating procedures. Information recorded as appropriate.

Assessor guide: confirm that –

Reporting authority can be identified. Location of recording facility can be identified and readily accessed.

Element 19.6A.3 Select power cells**Criteria 19.6A.3.1**

Appropriate batteries/power cells selected.

Assessor guide: observe that –

Manufacturer's recommendations/specifications are identified from charts and information sheets, and where appropriate is included as part of standard operating procedures. Appropriate type of replacement battery selected.

Assessor guide: confirm that –

Various types of batteries/power cells and their functions can be identified. Knowledge of cell construction can be given. The location of manufacturer's information/specifications can be identified and the contents are understood.

Element 19.6A.4 Replace power cells**Criteria 19.6A.4.1**

General inspection of surface/contact areas performed.

Assessor guide: observe that –

Inspection of the opened case surfaces and contact areas conducted in accordance with standard operating procedures. Moisture, corrosion, contaminants and damage identified.

Assessor guide: confirm that –

Knowledge of parts associated with power cell function can be given. Location and cause of moisture and corrosion effects can be identified.

Criteria 19.6A.4.2

Appropriate batteries/power cells selected and installed.

Assessor guide: observe that –

Manufacturer's recommendations/specifications are identified from charts and information sheets and in accordance with standard operating procedures. Contacts are cleaned, residue removed, and seals checked. Battery/power cell installed correctly.

Assessor guide: confirm that –

The correct handling/cleaning/adjustment procedures can be identified and understood. The functions of identified parts can be given.

Criteria 19.6A.4.3

Voltage, consumption and resistance measured.

Assessor guide: observe that –

Where applicable, voltage/ resistance/consumption measured according to standard operating procedures.

Assessor guide: confirm that –

Tools for measuring battery charge, current density, and watch resistance can be identified. Knowledge of the application and use of the testing equipment can be given.

Criteria 19.6A.4.4

Power cells handled and stored correctly.

Assessor guide: observe that –

Handling and storage conducted according to standard operating procedures and OH&S. Storage for old batteries is labelled appropriately. Disposal is in accordance with OH&S. Used mercury, silver oxide and lithium batteries are stored separately.

Assessor guide: confirm that –

The correct tools/equipment/procedures for safe handling and storage can be identified. OH&S issues for mercury and lithium batteries are understood.

Element 19.6A.5 Arrange water resistance and pressure testing**Criteria 19.6A.5.1**

Watches requiring water resistance and/or pressure testing are identified.

Assessor guide: observe that –

Water resistant watch cases are identified using relevant Australian and International Standards information.

Assessor guide: confirm that –

The location of relevant standards information can be given. Appropriate symbols and other identifying information can be given.

Criteria 19.6A.5.2

Water resistance and pressure testing is arranged.

Assessor guide: observe that –

Resistance/pressure testing is arranged with appropriate internal/external personnel. Watches are despatched and received in accordance with workplace procedures. Appropriate security, packaging and handling procedures are applied.

Assessor guide: confirm that –

Relevant internal and/or external water resistance and pressure testing bodies/personnel can be identified. Arrangements/procedures for despatch and receipt of watches can be given.

Range statement

This unit applies to the selection and replacement of digital/analogue watch power cells whilst operating in a jewellery/watch workshop environment with access to the appropriate equipment. Work undertaken autonomously or within a team environment using predetermined standards of quality, safety, workplace procedures and accepted workplace techniques/methods. Some knowledge of watch glasses and seals is required, however specific replacement functions for these are not covered by this unit. Testing functions relate only to the measurement of voltage, consumption, and resistance. This competency does not apply to diver and other water-resistant watch types. Water resistance and pressure testing is not covered by this unit, however identification of watches requiring testing as well as procedures for arranging testing are a requirement of this unit. Where power cell replacements in these two categories are of common practice with associated testing, and/or identification/cleaning/supply/fitting/of waterproofing/water resistance components, the appropriate horological units should be selected.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. Assessment should be conducted in an environment that the individual is familiar with.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with watch battery replacement or other units requiring the exercise of the skills and knowledge covered by this unit. Knowledge and experience in construction and polishing techniques are considered essential in order to achieve competency in this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 19.7A A Perform gemstone setting

Band – Specialisation band A

Field – Jewellery & horological

Unit Weight 6

Pre-requisite units - Path 1

18.1A Use hand tools

18.2A Use power tools/hand held operations

18.3A Use tools for precision work

19.3A Handle gem materials (basic)

Element 19.7A.1 Identify setting requirements

Criteria 19.7A.1.1

Setting requirements are identified.

Assessor guide: observe that –
Instructions are interpreted from job packets/
verbal/written instructions/diagrams.

Assessor guide: confirm that –
Setting processes can be identified. Terminology and
processes are understood.

Criteria 19.7A.1.2

Gemstone status is assessed.

Assessor guide: observe that –
Gemstone features are identified for setting Gemstones
handled appropriately.

Assessor guide: confirm that –
Gemstone handling procedures can identified for a range
of gems.

Criteria 19.7A.1.3

Setting metal is identified.

Assessor guide: observe that –
Metal is identified as appropriate for the desired setting
result.

Assessor guide: confirm that –
The process for determining the suitability of metal for
carving and setting requirements can be identified.

Element 19.7A.2 Prepare materials and equipment for setting

Criteria 19.7A.2.1

Tools are selected for use in achieving the desired
outcome.

Assessor guide: observe that –
Tools are selected according to work requirements.

Assessor guide: confirm that –
Knowledge of tool functions can be identified and
related to specific setting methods/techniques.

Criteria 19.7A.2.2

Tools are prepared and maintained to produce required
specifications.

Assessor guide: observe that –
Tools are prepared/adjusted/sharpened and maintained
Profiles, shapes, points and angles clamps, etc. are
maintained to workplace standards.

Assessor guide: confirm that –
Procedures for maintaining a variety of tools for optimum
performance can be given.

Criteria 19.7A.2.3

Metal is prepared for setting.

Assessor guide: observe that –

Metal is prepared according to job requirements.

Assessor guide: confirm that –

Process for achieving setting requirements is understood.

Element 19.7A.3 Perform gemstone setting**Criteria 19.7A.3.1**

Gemstones are secured correctly.

Assessor guide: observe that –

Stone(s) secured according to workplace procedures and using appropriate tools/methods.

Assessor guide: confirm that –

Appropriate setting techniques and procedures can be given.

Criteria 19.7A.3.2

Setting metal is finished/burnished to specification.

Assessor guide: observe that –

Knowledge of gemstone/metal properties applied according to standard operating procedures and OH&S issues. Appropriate hand tools and/or flexi-drive attachments used.

Assessor guide: confirm that –

Working properties of materials can be identified and understood for a variety of scenarios.

Range statement

This unit applies to most diamond and gem setting styles by manual methods, with the aid of basic electrical/mechanical equipment. Work undertaken autonomously or within a team environment using predetermined standards of quality, safety, workplace procedures and accepted workplace techniques/methods. Metals may include noble jewellery metals and their alloys. Do not select this unit for the setting of stones into wax, rubber, resin, etc. For production setting Unit 7.24 (Operate and monitor machine/process) should be considered. Where annealing and tempering are required, Unit 19.5 (Produce three-dimensional precision item) should also be selected. Techniques cover the basic forms of claw, grain and rub-over styles by manual methods, over a range of design styles.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. Assessment should be conducted in an environment that the individual is familiar with.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with gemstone setting or other units requiring the exercise of the skills and knowledge covered by this unit. Knowledge and experience in construction and polishing techniques are considered essential in order to achieve competency in this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied. The basic setting styles of grain, claw, and cabochon rub-over, are the relevant styles in this basic setting context. General carving/engraving ability must be demonstrated with the use of pointed/flat scrapers/gravers of appropriate design. Setting work should be clean and neat, to appropriate trade standards for security and accuracy. Finished work would be set straight, level and in symmetry with the overall design of the article. Set stones to be free from internal and surface damage caused in the setting process. Surfaces of the jewellery item(s) should be free from all evidence of cuts/scratches and abrasions caused by the setting and/or resultant trimming/cleaning process.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 19.8A A Prepare jewellery designs

Band – Specialisation band A

Field – Jewellery & horological

Unit Weight 6

Notes - This unit has dual status and is to be regarded as both a Specialisation band A unit and Specialisation band B unit for progression to C5 (AQF level V)

Pre-requisite units - Path 1

9.1A Draw and interpret sketch

18.1A Use hand tools

19.2A Prepare jewellery illustrations

13.3A Work safely with industrial chemicals and materials

18.2A Use power tools/hand held operations

13.4A Work safely with molten metals/glass

18.3A Use tools for precision work

Pre-requisite units - Path 2

8.10A Manually finish/polish materials

18.1A Use hand tools

19.2A Prepare jewellery illustrations

9.1A Draw and interpret sketch

18.2A Use power tools/hand held operations

13.4A Work safely with molten metals/glass

19.1A Jewellery metal casting

Pre-requisite units - Path 3

9.1A Draw and interpret sketch

18.3A Use tools for precision work

19.14A Perform hand engraving

18.1A Use hand tools

19.3A Handle gem materials (basic)

18.2A Use power tools/hand held operations

19.7A Perform gemstone setting

Element 19.8A.1 Identify design requirements

Criteria 19.8A.1.1

Design requirements, purpose and needs determined from appropriate sources.

Assessor guide: observe that –

Purpose and needs identified, including design restraints, budget considerations, item end-use, proportions and desired features, available materials.

Assessor guide: confirm that –

Knowledge of design resources and where to locate them.

Criteria 19.8A.1.2

Where necessary, further research/idea development undertaken.

Assessor guide: observe that –

Research/idea development undertaken to sufficient level as to determine customer expectations and/or design outcomes. Ethical and environmental contexts taken into consideration.

Assessor guide: confirm that –

Research techniques and available resources can be given. Awareness of social trends, cultural/environmental/social context Awareness of relevant industry literature. Awareness of existing designs, ethical & competitive consideration. Awareness of any applicable industry standards or regulations. Brainstorming techniques for research/idea development can be given.

Criteria 19.8A.1.3

Information is consolidated and analysed.

Assessor guide: observe that –

Data is collected and collated to match desired outcomes.

Assessor guide: confirm that –

Abstract and applied concepts/data can be recognised and evaluated for use in a commercial environment.

Criteria 19.8A.1.4

Where applicable, customer is advised on design considerations and limitations and further clarification made as necessary.

Assessor guide: observe that –

Concepts are communicated in terms suitable to relevant customer or other contacts e.g. engineer, master pattern maker.

Assessor guide: confirm that –

Design concepts/drafts are interpreted as appropriate for client/industry technician. Valid options can be given.

Element 19.8A.2 Develop design concept**Criteria 19.8A.2.1**

Concept developed employing design principles.

Assessor guide: observe that –

Logical conceptual development displayed Desired features are documented.

Assessor guide: confirm that –

Design principles including form, function, harmony, line definition (interpretive/actual) are understood.

Criteria 19.8A.2.2

Design process is documented.

Assessor guide: observe that –

Design process, features documented and design development notes maintained.

Assessor guide: confirm that –

Criteria 19.8A.2.3

Basic forms and proportions are established.

Assessor guide: observe that –

Basic form drawings produced. Drawing accurately reflects design concept.

Assessor guide: confirm that –

Drawing media and their functions/applications can be given including paper, watercolour, pastel ink pencil. Drawing tools and their functions/applications can be given including stencils, rubbers etc. Knowledge of geometric forms e.g. cones, cylinders, cube, rectangle, sphere etc. 3D concept understood - axis lines, conversion of 2D to 3D concepts, depth, perspective and scale (1,2,3 point).

Criteria 19.8A.2.4

Where applicable, decorative aesthetics applied.

Assessor guide: observe that –

Balance, proportion, highlights, shadowing, texturing effects are used appropriately.

Assessor guide: confirm that –

Enhancement techniques can be given.

Criteria 19.8A.2.5

Design concept confirmed as necessary.

Assessor guide: observe that –

Concept is confirmed with customer and redesign/modifications made as necessary.

Assessor guide: confirm that –

Element 19.8A.3 Produce drawings for item manufacture**Criteria 19.8A.3.1**

Appropriate manufacturing technologies selected.

Assessor guide: observe that –

Selected technologies are suitable for manufacture of item(s).

Assessor guide: confirm that –

Awareness of available manufacturing technologies and their suitability for jewellery manufacture.

Criteria 19.8A.3.2

Working, technical and finished drawings are developed.

Assessor guide: observe that –

Prepared drawings/designs comply with industry parameters.

Assessor guide: confirm that –

Types of working drawings and their uses can be given. The inter-relation between technical and design drawings is understood.

Criteria 19.8A.3.3

Production requirements/instructions specified and communicated to appropriate persons.

Assessor guide: observe that –

Appropriate actions undertaken to assess level of industry requirements.

Assessor guide: confirm that –

Industry requirements and availability of industry expertise can be identified.

Range statement

Work undertaken autonomously or in a team environment using predetermined standards of quality, safety and workshop procedures. Jewellery designs are developed with view to producing the designed item/s using current commercial procedures, including traditional hand-fabrication techniques and/or in combination with a range of manufacturing technologies. Procedures may include CNC and mass finishing activities. Preparation of designs may include 2D and 3D CAD applications. Where CAD is used, the appropriate units should also be selected. Where jewellery illustrations only are prepared, Unit 19.2A (Prepare jewellery illustrations) should be selected.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team.

Assessment should be conducted in an environment that the individual is familiar with.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with preparing jewellery designs or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 19.9A A Perform investment procedures for lost wax casting process

Band – Specialisation band A

Field – Jewellery & horological

Unit Weight 1

This unit covers the competencies required for the preparation of investment flasks for jewellery casting.

Pre-requisite units - Path 1

13.3A Work safely with industrial chemicals and materials 18.1A Use hand tools

Pre-requisite units - Path 2

2.7C10 Perform computations - basic 7.24A Operate and monitor machine/process 18.1A Use hand tools

Element 19.9A.1 Prepare investment materials

Criteria 19.9A.1.1

Assembled tree/materials checked, if appropriate

Assessor guide: observe that –
Pre-assembled wax is checked for security, size, and weight

Assessor guide: confirm that –
The procedures for checking built wax are identified and understood

Criteria 19.9A.1.2

Appropriate casting method and equipment selected

Assessor guide: observe that –
Standard operating procedures are used to guide the selection process

Assessor guide: confirm that –
Casting methods and equipment can be identified, and processes are understood

Criteria 19.9A.1.3

Associated tools and equipment prepared

Assessor guide: observe that –
Sprue and investment materials selected/ checked/ cleaned according to standard operating procedures

Assessor guide: confirm that –
The correct sprue/investment tools/ equipment/ materials can be identified, their purposes given

Criteria 19.9A.1.4

Sprue/tree materials prepared/built if appropriate

Assessor guide: observe that –
If appropriate, wax item/s assembled according to standard operating procedures Appropriate components selected Weights are recorded according to standard operating procedure

Assessor guide: confirm that –
The techniques for sprue/tree styles can be identified Knowledge of the selection/application of the processes can be given Recording procedures can be identified

Element 19.9A.2 Invest flask

Criteria 19.9A.2.1

Flask is assembled for casting

Assessor guide: observe that –
Appropriate flask size is selected and assembled with components as per standard operating procedures

Assessor guide: confirm that –
The selection of flask and components can be identified for the specific casting process The reasons for selections can be given

Criteria 19.9A.2.2

Investment is mixed appropriately

Assessor guide: observe that –
Calculations are made for the correct proportions of investment material and water, and weighed out accurately Mix, vibrate and vacuum procedures are undertaken according to specifications, standard operating procedures and occupational health and safety requirements

Assessor guide: confirm that –
Procedures and computations for mixing proportions, time calculations, volume and weights etc. can be performed occupational health and safety requirements/issues can be identified Knowledge of processes and the result of inappropriate methods/actions can be given

Criteria 19.9A.2.3

Curing stage prepared

Assessor guide: observe that –
Invested flask is completed according to standard operating procedures Appropriate gloss off/set time is allowed prior to base removal

Assessor guide: confirm that –
Requirements for curing/set stage can be identified and understood

Element 19.9A.3 Operate “lost wax” sequence**Criteria 19.9A.3.1**

“Low melt” wax evacuated by steam process if appropriate

Assessor guide: observe that –
Steamer and process are operated according to standard operating procedures and occupational health and safety requirements Flasks inspected for residue prior to “burn-out”

Assessor guide: confirm that –
Steamer process can be identified and understood Suitability of flask/investment for burn-out can be given

Criteria 19.9A.3.2

“Burn-out” procedure selected and applied

Assessor guide: observe that –
Appropriate burn-out procedure/equipment selected Sequence and values for time, temperature, and/or cam settings are in accordance with standard operating procedures

Assessor guide: confirm that –
Sequence, procedures, adjustments for variables can be identified Knowledge of procedures and results can be given for a variety of situations

Criteria 19.9A.3.3

Investment flask positioned/stored

Assessor guide: observe that –
Flask is positioned/stored safely in accordance with standard operating procedures Oven/kiln cavity is inspected and adjusted if appropriate

Assessor guide: confirm that –
Procedures for storage and positioning can be identified

Element 19.9A.4 De-contaminate/clean site**Criteria 19.9A.4.1**

Tools, equipment and site area cleaned as appropriate

Assessor guide: observe that –
The working area, and all tools and investing equipment are cleaned of investment residue in accordance with standard operating procedures and occupational health and safety requirements Residue and materials are disposed of/stored according to occupational health and safety requirements

Assessor guide: confirm that –
The procedures for cleaning, storage and/or removal of materials can be given The reasons for appropriate/approved housekeeping functions can recognised and understood

Range statement

This unit applies to the preparation of investment flasks using manual and/or automatic equipment for jewellery casting procedures. Work undertaken autonomously or within a team environment using pre-determined standards of quality, safety, workplace procedures and accepted workplace techniques/methods.

Evidence**Assessment context**

This unit may be assessed on the job, off the job, or a combination of on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team.

Assessment should be conducted in an environment that the individual is familiar with.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with investment procedures for “lost wax” casting process or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 19.10A A Produce rubber moulds for lost wax casting process

Band – Specialisation band A

Field – Jewellery & horological

Unit Weight 2

This unit covers the competencies required for the preparation of flexible moulds for the purpose of replicating an original model.

Element 19.10A.1 Prepare and pack mould frame/systems

Criteria 19.10A.1.1

Appropriate mould frame/moulding system selected for given job

Assessor guide: observe that –

Appropriate frame/system selected to suit master requirements in accordance with standard operating procedures

Assessor guide: confirm that –

Procedures for assessing frame/system can be given
The specific master requirements can be explained

Criteria 19.10A.1.2

Appropriate rubber selected for style of master

Assessor guide: observe that –

Type/needs of master identified and rubber selected in accordance with standard operating procedures

Assessor guide: confirm that –

Procedures for assessing rubber/ master suitability/compatibility can be given Knowledge of working limitations of rubber can be demonstrated

Criteria 19.10A.1.3

Rubber prepared and packed correctly

Assessor guide: observe that –

Master, frame/system prepared/packed in accordance with standard operating procedures, OH&S and manufacturer specifications

Assessor guide: confirm that –

Procedures for correct packing technique can be demonstrated Knowledge of packing variations for a range of situations can be given

Element 19.10A.2 Vulcanise/cure rubber

Criteria 19.10A.2.1

Appropriate curing system selected

Assessor guide: observe that –

The appropriate variables of time, temperature, and pressure are selected in accordance with standard operating procedures, and manufacturers specifications

Assessor guide: confirm that –

The methods for establishing the appropriate time, temperature and pressure settings for the selected process can be identified The significance of these variables can be given

Criteria 19.10A.2.2

Assembled mould cured, cooled, removed

Assessor guide: observe that –

Preparations prior to mould release are performed in correct sequence according to standard operating procedures and manufacturers specifications

Assessor guide: confirm that –

The stages in the process for mould curing, removal and cooling can be explained Occupational health and safety issues can be identified and described

Element 19.10A.3 Release mould**Criteria 19.10A.3.1**

Appropriate tools and procedure for the release of master pattern selected

Assessor guide: observe that –

Tools/methods for safe and accurate release of master are selected according to release procedure

Assessor guide: confirm that –

The process for correct selection of tools/ procedures can be identified

Criteria 19.10A.3.2

Master pattern is released correctly

Assessor guide: observe that –

The master is released safely and without damage using tools and procedures according to standard operating procedures and occupational health and safety requirements

Assessor guide: confirm that –

The appropriate sequence of procedures for release of master can be identified The placement of mould/vent lines can explained

Range statement

This unit applies to the preparation of flexible moulds to replicate an original model. Work undertaken autonomously or within a team environment using predetermined standards of quality, safety, workplace procedures and accepted workplace techniques/methods. Types of rubber material used may include natural and silicon varieties of differing working specifications such as shrinkage and transparency. Vulcanisation may include RTV as well as standard heat and pressure combinations.

Evidence**Assessment context**

This unit may be assessed on the job, off the job, or a combination of on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team.

Assessment should be conducted in an environment that the individual is familiar with.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with producing rubber moulds for “lost wax” process or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 19.11A A Perform wax injection of moulds for lost wax casting process

Band – Specialisation band A

Field – Jewellery & horological

Unit Weight 2

This unit covers the competencies required injecting materials under pressure for investment and burn-out aspects within "lost wax" casting procedures.

Element 19.11A.1 Perform wax injection of moulds

Criteria 19.11A.1.1

Appropriate wax material selected

Assessor guide: observe that –
Wax type is selected according to wax/ model/ cavity specifications

Assessor guide: confirm that –
The variables associated with the selection process can be identified and explained

Criteria 19.11A.1.2

Injection equipment/tools prepared

Assessor guide: observe that –
Selections and adjustments equipment/tools made according to wax/model/cavity specifications and standard operating procedures

Assessor guide: confirm that –
The standard operating procedures for wax injection equipment/processes can be identified and understood for the given values of time, temperature, pressure

Criteria 19.11A.1.3

Moulds prepared correctly

Assessor guide: observe that –
Mould prepared according to workplace standards for automatic/manual procedures

Assessor guide: confirm that –
Mould conditions can be identified and inappropriate features rectified

Criteria 19.11A.1.4

Wax injection procedures carried out correctly

Assessor guide: observe that –
Injection is completed according to specifications and standard operating procedures

Assessor guide: confirm that –
Injection procedures can be identified Minor variations and adjustments to processes/ equipment situations can be given

Element 19.11A.2 Remove and inspect patterns

Criteria 19.11A.2.1

Wax pattern is removed without damage

Assessor guide: observe that –
Duplicated wax pattern is removed using one/two/three piece techniques as appropriate, without distortion or breakage

Assessor guide: confirm that –
Undamaged wax duplicate removal techniques for a range of scenarios can be given

Criteria 19.11A.2.2

Duplicate wax pattern inspected and stored

Assessor guide: observe that –

Duplicate is checked for compliance with master/specifications, and inspected for irregularities
 Item is stored according to standard operating procedures
 Irregularities are reported/recorded as appropriate

Assessor guide: confirm that –

Procedures for wax duplicate inspection can be given
 Types of common irregularities can be identified
 Causes of imperfections can be given Remedies for imperfections can be identified Safe storage procedures can be identified Reporting authority can be identified

Criteria 19.11A.2.3

Work area secured and cleaned

Assessor guide: observe that –

All excess materials are removed/stored, and equipment/tools cleaned and stored according to workplace procedures Disposal of waste complies with occupational health and safety and legislative requirements The immediate work area is maintained safe and clean according to standard operating

Assessor guide: confirm that –

Procedures for safe cleaning, disposal, and storage can be given The reasons for standard operating procedures and occupational health and safety measures can be given

Range statement

This unit applies primarily to organic/synthetic wax injection, but may include resin and plastic materials injected under pressure for investment and burn-out aspects within "lost wax" casting procedures. Work undertaken autonomously or within a team environment using predetermined standards of quality, safety, workplace procedures and accepted workplace techniques/methods.

Evidence**Assessment context**

This unit may be assessed on the job, off the job, or a combination of on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team.

Assessment should be conducted in an environment that the individual is familiar with.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with wax injection of moulds for "lost wax" casting process or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 19.12A A Produce jewellery wax model

Band – Specialisation band A

Field – Jewellery & horological

Unit Weight 4

Pre-requisite units - Path 1

18.1A Use hand tools

18.2A Use power tools/hand held operations

18.3A Use tools for precision work

Element 19.12A.1 Determine master requirements

Criteria 19.12A.1.1

Customer specifications are identified.

Assessor guide: observe that –

Customer specifications are identified from verbal instruction/supplied item/illustration. Method of construction of wax model is suitable for the supplied specifications.

Assessor guide: confirm that –

Factors affecting construction of wax model can be given, including type of wax, hand tools, method of construction, final finish, weight of finished product.

Element 19.12A.2 Prepare materials for production of wax model

Criteria 19.12A.2.1

Appropriate waxes are selected.

Assessor guide: observe that –

Wax selection allows for variation in end product. Wax properties are selected to suit construction method and required finish.

Assessor guide: confirm that –

Variations in end product and the relationship with wax types can be given.

Criteria 19.12A.2.2

Stock materials are cut to appropriate length.

Assessor guide: observe that –

Stock materials are cut by most appropriate method for design, allowing for variation and/or error in process and finish.

Assessor guide: confirm that –

Methods based upon the outcome requirements/specifications and waste minimisation can be given.

Criteria 19.12A.2.4

Appropriate tools are selected and used.

Assessor guide: observe that –

Tools are selected to suit wax work.

Assessor guide: confirm that –

Tools for preparing and producing wax can be given for specific wax types and constructions.

Element 19.12A.3 Produce wax models**Criteria 19.12A.3.1**

Material use and production time is optimised.

Assessor guide: observe that –

Shapes are roughed out, with material removed to minimise wastage. Material removed to minimise effort/time in final finishing, taking into account minimal wastage.

Assessor guide: confirm that –

Importance of minimising material wastage and time taken during roughing/finishing can be explained.

Criteria 19.12A.3.2

Wax is sculpted to specifications.

Assessor guide: observe that –

A close match of model features to original specifications is achieved. Wax joints are fused to achieve optimum strength and quality. Sections are added/backfilled as required.

Assessor guide: confirm that –

Appropriate key features/datum points are identified.

Element 19.12A.4 Finish wax models**Criteria 19.12A.4.1**

Imperfections in final wax model are minimised.

Assessor guide: observe that –

Best surface is produced to suit final product requirements.

Assessor guide: confirm that –

Purpose/requirements for selected surface finish can be identified.

Criteria 19.12A.4.2

Surface finishes are applied.

Assessor guide: observe that –

Texture finishing, high polishes, etc are applied as required. Appropriate protective safety equipment is worn, including dust mask and safety goggles.

Assessor guide: confirm that –

Melting wax, effects of toxic fumes understood.

Element 19.12A.5 Assess suitability of final wax product**Criteria 19.12A.5.1**

Product is inspected for compliance with specifications.

Assessor guide: observe that –

Product is inspected for correct tolerances, allowance for casting shrinkage and finishing processes.

Assessor guide: confirm that –

Effects of casting shrinkage and finishing processes can be given.

Criteria 19.12A.5.2

Final product is modified as necessary.

Assessor guide: observe that –

Final product is modified as necessary to meet required tolerances and finishes.

Assessor guide: confirm that –

Evaluation of product by weight formulation can be given.

Range statement

This unit covers the production of wax models for a range of jewellery products, simple to moderate carved forms, simple to moderate structural forms. Work undertaken autonomously or within a team environment using predetermined standards of quality, safety, workplace procedures and accepted workplace techniques/methods. Tools may include electric and handheld tools, e.g., heat irons, wax guns, saws, carving tools, wax files, flaming torch. Materials may include those of different colours/hardness/properties. Processes may include free-form carving moderate detail with some fine detail. This unit is not intended to include fine wire filigree work. Appropriate awareness of occupational health and safety issues and measures, including the use of protective equipment is applied, including control of melting wax, knowledge of effects of toxic fumes. For modelling with the use of computer aided equipment, Units 9.9B Create 2D drawings using computer aided design system and Units 9.10B Create 3D models using computer aided design system should be considered.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. Assessment should be conducted in an environment that the individual is familiar with.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with jewellery wax production or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 19.13A A Produce jewellery metal masters

Band – Specialisation band A

Field – Jewellery & horological

Unit Weight 4

Notes - This unit has dual status and is to be regarded as both a Specialisation band A unit and Specialisation band B unit for progression to C5 (AQF level V)

Pre-requisite units - Path 1

8.10A Manually finish/polish materials

9.1A Draw and interpret sketch

13.4A Work safely with molten metals/glass

19.1A Jewellery metal casting

Element 19.13A.1 Determine master pattern requirements

Criteria 19.13A.1.1

Interpret specifications and drawings.

Assessor guide: observe that –

All data is collected and assessed for practical applications according to standard operating procedures.

Assessor guide: confirm that –

Location of information/specifications can be identified. Clarification approval processes can be given. Collective information/drawings/specification/product development plans are understood.

Criteria 19.13A.1.2

Technique/process to achieve suitable quality finish for masters selected.

Assessor guide: observe that –

Appropriate methods are selected for format requirements according to standard operating procedure.

Assessor guide: confirm that –

Wrought, forge, machine and cast techniques are understood. The valid application for each case can be identified.

Criteria 19.13A.1.3

Select item material(s).

Assessor guide: observe that –

Materials are selected according to standard operating procedures and object/production specifications.

Assessor guide: confirm that –

The appropriate properties/function of materials can be identified. All pre-requisite working specifications/abilities/limitations of selected materials are understood. Stored data on specifications and processes can be readily accessed.

Criteria 19.13A.1.4

Select appropriate tools, equipment and processes.

Assessor guide: observe that –

Tools/equipment/processes are selected according to the format requirements, and standard operating procedures.

Assessor guide: confirm that –

Knowledge of tools and equipment is matched correctly to the processes, and fundamental variations are understood.

Element 19.13A.2 Produce master**Criteria 19.13A.2.1**

Materials are marked out and/or construction plan developed to meet specifications/stages of process.

Assessor guide: observe that –

Apply a working knowledge of metals and materials.

Assessor guide: confirm that –

The ability to recognise and understand planning/process stage is evident. Difference between master and finished item specifications are understood prior to assembly/construction/solder/drill operations.

Criteria 19.13A.2.2

Prepare pattern material(s).

Assessor guide: observe that –

Using acceptable techniques/procedures, and utilising appropriate tools and equipment, the item/components is/are pre-formed/produced to size and shape. Work is checked for compliance to known specifications, particularly in relation to the calculated requirements of the retail finished product.

Assessor guide: confirm that –

Knowledge of fine detail work processes can be given OH&S issues are understood.

Criteria 19.13A.2.3

Produce master.

Assessor guide: observe that –

All work is undertaken according to standard operating procedures and OHS&W. Product is checked for compliance to specifications and design outcomes.

Assessor guide: confirm that –

Levels of acceptable performance and productivity outcomes can be identified. Knowledge of the finishing process can be given. Understands the sequential processes required for design outcomes.

Element 19.13A.3 Finish and inspect work

Criteria 19.13A.3.1

Check item for compliance with specifications.

Assessor guide: observe that –
Product is matched to original design concept/drawings/specifications. Surface condition inspected for pre-treatment/plating process (if appropriate). Allowance made for sequential processes.

Assessor guide: confirm that –
Inspection and compliance checks can be identified. Surface/parts/areas can be assessed as appropriate for post production processes if required for setting/electroplating/enamelling, and for the subsequent processes of moulding and waxing.

Criteria 19.13A.3.2

Record all weights and measurements.

Assessor guide: observe that –
Statistical evidence is recorded according to standard operating procedures.

Assessor guide: confirm that –
Reasons for the recording of specifications can be given. Appropriate measuring devices and recording methods can be identified.

Criteria 19.13A.3.3

Fit correct sprue material if appropriate.

Assessor guide: observe that –
If required, sprue section is positioned/secured in the approved manner.

Assessor guide: confirm that –
Handling and design needs associated with sprue placement can be identified. Appropriate knowledge of wax injection, moulding, casting, molten metal flow/solidification can be given.

Criteria 19.13A.3.4

Apply final finish, where appropriate, and store item.

Assessor guide: observe that –
Final treatments are undertaken according to standard operating procedures and OH&S. Handling and storage of item conducted according to workplace requirements.

Assessor guide: confirm that –
Procedures for final treatment/safe handling/storage of item can be identified and understood. Reasons why all tools, equipment, resources and reference material are stored in accordance with OH&S and standard operating procedures can be given.

Criteria 19.13A.3.5

Evaluate and compare master to production sample where appropriate.

Assessor guide: observe that –
Appropriate design specifications are compared/calculated.

Assessor guide: confirm that –
Relevancy of calculations/specifications are understood.

Range statement

This unit requires the application of precision measurement and hand-making/machine skills to a greater level than that required in Unit 19.5 A (Produce three-dimensional precision items) Competency in this unit cannot be fully met without appropriate comparison to the finished production item. The unit covers the manufacture of jewellery master pattern(s) for jewellery reproduction, mainly by the hand held application of processes whilst working autonomously. Materials include jewellery alloys and/or their base metals. Understanding of the principles of casting, moulding, shrinkage, and wax injection are required. The requirements for quality results through general production processes used to finish the reproductions are understood. Work may be carried out as part of a team to predetermined standards of quality and safety. Where machining is required as a major component of this manufacturing concept, then unit 7.5 (Perform general machining) should be selected. The equipment used may include hand and power tools, lathes and non-CNC machines. Where component(s) require preparation or manufacture by NC/CNC/CAD/CAM as an integral part of this process by the person working autonomously, the relevant competencies should be accessed. If the electro-deposition and/or electro-forming of metal is required, 7.24A (Operate and monitor machine/process) or Unit 8.3A (Perform electroplating operations) should also be selected. This unit should not be selected when Unit 18.14 (Tool, gauge and die manufacture) has already been selected.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. Assessment should be conducted in an environment that the individual is familiar with.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with gemstone handling or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities. Evidence text: The successful completion of a production item (within production parameters) from this master pattern is evidence of the scope of understanding and performance of the practical applications.

This should be valid over a given range of open and closed designs.

Underpinning knowledge of shrinkage and sprue design for item is understood. Able to compare, evaluate and calculate shrinkage/proportion measurements over a range of variables that are affected by sequential steps in the moulding and waxing processes.

Unit MEM 19.14A A Perform hand engraving

Band – Specialisation band A

Field – Jewellery & horological

Unit Weight 4

Pre-requisite units - Path 1

18.1A Use hand tools

Element 19.14A.1 Identify engraving requirements

Criteria 19.14A.1.1

Engraving requirements are identified from applicable documents.

Assessor guide: observe that –

Instructions, worksheets, drawings and other sources of information to perform the work accessed and engraving requirements identified.

Assessor guide: confirm that –

Engraving terminology, instructions on relevant documents and can be explained. Appropriate methods for the collection of task information can be given.

Criteria 19.14A.1.2

Sequence of procedures correctly identified.

Assessor guide: observe that –

A prepared job plan identifies the task sequence.

Assessor guide: confirm that –

The function/purpose of each task in the sequence can be identified. The appropriate method for securing/holding the work can be identified.

Element 19.14A.2 Select and maintain engraving equipment and accessories

Criteria 19.14A.2.1

Appropriate equipment is selected for use.

Assessor guide: observe that –

Selected gravers, burins, scorpers and other tools are appropriate to specified outcomes.

Assessor guide: confirm that –

Different gravers, burins, scorpers and other tools and tools can be identified and their applications given.

Criteria 19.14A.2.2

Gravers are prepared to industry standards.

Assessor guide: observe that –

Graver shape and cutting angles machined and sharpened using appropriate techniques and equipment.

Assessor guide: confirm that –

Techniques for producing and maintaining cutting edges can be given. Equipment used for maintaining gravers can be identified and function/operation explained. Required industry standards can be given.

Element 19.14A.3 Perform hand engraving**Criteria 19.14A.3.1**

Item measured and marked out for engraving as required.

Assessor guide: observe that –

Datum lines/points are used as required.

Assessor guide: confirm that –

The appropriate reference data/materials/tools can be identified.

Criteria 19.14A.3.2

Workpiece is positioned and held/clamped effectively and without damage to the workpiece.

Assessor guide: observe that –

Appropriate safe handling of the workpiece and securing method used.

Assessor guide: confirm that –

The reasons for the selection of securing method and its limitations can be identified.

Criteria 19.14A.3.3

Work is undertaken according to standard operating procedure and workplace/industry standards.

Assessor guide: observe that –

All work is carried out safely and relative to the individual specifics of the work plan. Points/cutting edges/polished faces are maintained throughout the work process. Quality of results meets with workplace/industry standards.

Assessor guide: confirm that –

Appropriate safety knowledge and tool maintenance procedures can be identified. Specific techniques for producing desired outcomes can be given.

Range statement

This unit covers basic hand tool applications with burins/scrapers/gravers as the predominant selection of hand tools, and does not include the use of any power/air driven apparatus. Work includes basic block/script lettering and carving techniques on mostly flat surfaces to achieve patterns in relief or intaglio. Where the work being performed requires the item to have shaping/drilling/contour modification using power tools then Unit 18.2A (Use power tools/hand held operations) should also be selected.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. Assessment should be conducted in an environment that the individual is familiar with.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with hand engraving or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 19.15A A Perform jewellery enamelling

Band – Specialisation band A

Field – Jewellery & horological

Unit Weight 4

Pre-requisite units - Path 1

13.3A Work safely with industrial chemicals and materials 18.1A Use hand tools

Element 19.15A.1 Identify enamelling requirements

Criteria 19.15A.1.1

Item materials & construction assessed for suitability for enamelling.

Assessor guide: observe that –

Item features/properties/construction analysed for suitability for enamelling. Colour selection is appropriate to job specification/ design. Appropriate technique is selected.

Assessor guide: confirm that –

Factors for determining suitability for enamelling can be identified, including available enamelling compositions, firing temperatures, metal type and properties, item construction. Different enamelling techniques & terms can be given.

Criteria 19.15A.1.2

Appropriate enamelling technique/ materials selected.

Assessor guide: observe that –

Enamelling technique/ materials selected to suit job specification/design, item properties and construction.

Assessor guide: confirm that –

Enamelling compositions and techniques can be given and related to specific item properties and factors such as metal type/properties, item construction, firing temperatures. Enamels & forms of availability for purchase can be given including leaded/unleaded, opaque/transparent. Terms applied to various enamelling techniques can be described. Use of enamel colour chart to determine suitable colours can be demonstrated.

Criteria 19.15A.1.3

Enamelling requirements identified.

Assessor guide: observe that –

Instructions and job requirements are interpreted from job packets, verbal, written instructions/diagrams.

Assessor guide: confirm that –

Process can be identified, terminology and processes are understood.

Element 19.15A.2 Prepare items & materials for enamelling

Criteria 19.15A.2.1

Enamels are prepared for enamelling operation.

Assessor guide: observe that –
Enamels washed and/or ground as appropriate.
Occupational health and safety practices followed and personal protective equipment used/worn.

Assessor guide: confirm that –
Correct working procedures during the preparation of enamel powder can be given. Techniques for washing & grinding enamels, when required and reasons for doing so can be given.

Criteria 19.15A.2.2

Metal surface prepared for enamelling.

Assessor guide: observe that –
Metals are cleaned, polished/burnished & pre-treated by hand or pickling as appropriate. Appropriate methods are selected according to standard operating procedure.

Assessor guide: confirm that –
Preparation of metal surfaces by hand cleaning, polishing/burnishing, chemical pre-treatment by acid, surface depletion methods & application to different metals can be given. Hazards & safety measures relating to pre-treatment of metals and preparation of enamels/metals can be given.

Criteria 19.15A.2.3

Additional processing of item prior to enamelling carried out.

Assessor guide: observe that –
Additional processing requirements are identified. Impact on enamelling process, if any, identified and actions taken at appropriate stage. Processing carried out using appropriate tools and techniques. Processing conforms to specification.

Assessor guide: confirm that –
Additional processing can be given, including stamping, engraving, saw piercing, chasing, oxidising, roller pressing. Tools and equipment for processing can be identified and their uses explained.

Element 19.15A.3 Enamel jewellery items

Criteria 19.15A.3.1

Equipment and items are set up for firing.

Assessor guide: observe that –
Enamel is applied correctly to achieve desired outcome. Equipment is set to correct temperature. Items are positioned correctly for firing using appropriate work holding devices.

Assessor guide: confirm that –
Methods of applying enamels including wet packing, dry dusting can be given. Melting temperatures of metals and enamels can be given. Work holding devices can be identified and related to items being enamelled.

Criteria 19.15A.3.2

Items fired correctly.

Assessor guide: observe that –

Stages are monitored and gauged. Items removed from heat source at appropriate time to avoid over/under firing. Items fired appropriate number of times using kiln and torch. Different firing techniques are applied as appropriate including counter enamelling, annealing, cleaning & lapping processes between firing.

Assessor guide: confirm that –

Visual appearance of enamel at diff stages of firing process can be given. Counter enamelling techniques & reasons for doing so can be given. Cleaning & lapping processes between firing are understood.

Element 19.15A.4 Finish and inspect work**Criteria 19.15A.4.1**

Final finishes are applied.

Assessor guide: observe that –

Final treatments/finishes are applied according to standard operating procedure and occupational health and safety requirements. Items are masked out as required and final firing polishing undertaken to specification.

Assessor guide: confirm that –

Different finishes & methods for achieving specific effects can be given. Masking out methods can be given. Final firing and polishing methods can be given.

Criteria 19.15A.4.2

Product checked for compliance.

Assessor guide: observe that –

Compliance to design outcomes is verified against specifications and/or job requirements. Non conformances and their causes are identified.

Assessor guide: confirm that –

Features and factors for compliance can be given from original specifications and/or job requirements. Common enamelling faults/incorrect outcomes and their causes can be given including oxidation, staining, under/over firing.

Criteria 19.15A.4.3

Faults are rectified.

Assessor guide: observe that –

Faults are rectified using standard techniques/ methods and standard operating procedures.

Assessor guide: confirm that –

Actions to rectify faults using standard techniques/methods can be given.

Criteria 19.15A.4.4

Relevant job data is recorded.

Assessor guide: observe that –

Job data is recorded in accordance with standard operating procedure.

Assessor guide: confirm that –

Job data to be recorded can be identified. Procedure to record data can be given.

Range statement

This unit applies to most jewellery-scale methods of application and some larger scale methods to precious and base metals. Work undertaken autonomously or within a team environment using predetermined standards of quality, safety, workplace procedures and accepted workplace techniques/methods. Enamelling of items may include manufacture of jewellery items such as rings, brooches, earrings, pendants and other small scale objects. Enamelling techniques may apply to torch and kiln firing and would include dusting, cloisonne, basse taille and champleve. Excludes complex three-dimensional forms and plique a jour techniques. Occupational health and safety extends to safe work practices and use of personal protective equipment. Knowledge and skills covered by this unit include enamels, base metals and properties relating to enamelling, enamelling techniques, firing techniques and work holding devices, faults and common rectification methods.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team.

Assessment should be conducted in an environment that the individual is familiar with.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with jewellery enamelling or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 19.16A A Construct jewellery components

Band – Specialisation band A

Field – Jewellery & horological

Unit Weight 4

This unit covers the skills and knowledge required to construct jewellery components or single-piece items of basic design.

Pre-requisite units - Path 1

5.6A Perform brazing and/or silver soldering

9.1A Draw and interpret sketch

18.1A Use hand tools

Element 19.16A.1 Identify pattern and component/item requirements

Criteria 19.16A.1.1

Component/item specifications are identified from work instruction.

Assessor guide: observe that –

Component type, design, material type and specifications are identified from verbal/written instructions, jewellery illustrations and samples.

Assessor guide: confirm that –

Common jewellery items and components of items can be identified. Common metal types, applications and properties can be given.

Criteria 19.16A.1.2

Design transfer requirements are identified from work instruction.

Assessor guide: observe that –

Transfer method is correctly identified from work instruction. Transfer materials, tools and equipment correctly selected.

Assessor guide: confirm that –

Different methods of transfer, including to template or direct to workpiece can be given.

Criteria 19.16A.1.3

Forming, joining and finishing requirements are identified from work instruction.

Assessor guide: observe that –

Required techniques/methods and steps are correctly identified. Tools and equipment for forming, joining and finishing are correctly selected.

Assessor guide: confirm that –

Techniques, tools and equipment for bending, folding, curving shaping, surface impressing and joining can be given. Techniques, tools and equipment for finishing/polishing can be given.

Element 19.16A.2 Transfer designs to templates and workpieces

Criteria 19.16A.2.1

Workpieces are prepared as required for drawing transfer.

Assessor guide: observe that –

Workpiece is cut, rolled or shaped to correct size/thickness if required.

Assessor guide: confirm that –

Criteria 19.16A.2.2

Accurate representations component specifications are produced onto templates or workpieces.

Assessor guide: observe that –

Markings are transcribed clearly and accurately onto workpiece or template, as required. Templates are securely adhered to workpieces, as required.

Assessor guide: confirm that –

Criteria 19.16A.2.3

Metal wastage is minimised

Assessor guide: observe that –

Design is transferred to optimise use of material.

Assessor guide: confirm that –

Importance of minimising wastage can be given.

Element 19.16A.3 Produce 2D patterns/blanks**Criteria 19.16A.3.1**

Patterns/blanks are produced to specification.

Assessor guide: observe that –

Workpiece is sawpierced and drilled as appropriate and filing and finishing requirements minimised. Design markings are accurately followed. Pattern/blank is filed, emery finished, polished as required to achieve specified pattern.

Assessor guide: confirm that –

Correct blades, drills files and materials for application can be given.

Element 19.16A.4 Form and finish components/items**Criteria 19.16A.4.1**

The formed item conforms to design requirements.

Assessor guide: observe that –

Components are folded, bent, curved, dapped etc. as required. Correct symmetry, angle, shape is achieved to specification.

Assessor guide: confirm that –

Methods for /techniques for forming components/single piece items can be given.

Criteria 19.16A.4.2

Appropriate tools and equipment are selected for forming, joining and finishing

Assessor guide: observe that –

Correct tool is selected for forming, joining and finishing.

Assessor guide: confirm that –

Tools and equipment for forming and finishing can be given.

Criteria 19.16A.4.3

Components/formed items are joined as required. removed by filing, emery etc. as appropriate. Re-forming

Assessor guide: observe that –

Joins are flush and correctly aligned. Excess materials are adjustments are undertaken if necessary to achieve specifications.

Assessor guide: confirm that –

Methods and materials for joining can be given.

Criteria 19.16A.4.4

Components/items are finished to specification.

Assessor guide: observe that –

Scratches, scribe marks and other markings are removed by file, emery etc. to a fine emery finish. Item is polished according to standard operating procedure.

Assessor guide: confirm that –

Methods, tools and materials for removing markings can be given. Polishing equipment is operated safely and correct polishing technique is used.

Range statement

This unit covers the skills and knowledge required to construct jewellery components or single-piece items of basic design. It requires the ability to use common jewellery tools and equipment and safe and efficient work practices to transfer designs to templates and workpieces, produce two-dimensional patterns/blanks and form and finish components/items.

This work would be carried out autonomously or in a team environment, under supervision and within organisational guidelines.

Range Name**Description**

Items may include:	Components or single-piece items of basic design
Forming methods may include:	Cutting, folding, bending, curving, dapping
Joining methods may include:	Primarily by brazing/silver soldering but may include other methods such as riveting
Finishing processes may include:	Filing, emery finishing, basic polishing
Transfer of design may include:	Transfer direct to workpiece using permanent pen, scribe, freehand and/or by compass, dividers, chinagraph pencil, carbon paper tracing or drawn/copied to template and adhered to workpiece
Level of supervision:	Under direct supervision.
Tools and equipment may include:	Compass, dividers, rules, squares, spring gauges, vernier calipers, piercing saw, files, drill press/pedestal drill, polishing equipment and compounds, ultrasonic cleaner.
Metals and consumables may include:	Silver, gold, brass, copper, solders and fluxes, drills and blades, polishing compounds, cleaning and finishing materials, adhesives.
Instructions may include:	Instructions from supervisor/management, job packet.
Appropriate persons may include:	Supervisors/managers, colleagues.
Client may include:	Owner, supervisor/manager.
Social and cultural differences may be expressed in:	Language, traditional practices and observations, beliefs, values, practices, symbols, design artefacts, food, diet, dress, religious and spiritual observances, social conventions and customs, cultural stereotypes, conventions of gender/sexuality.
Organisational requirements may relate to:	Standard operating procedures and work methods, quality systems and processes, security and confidentiality procedures, induction and training, employer and employee rights and responsibilities, own role and responsibility, OHS procedures and programs, emergency and evacuation procedures, code of conduct, access and equity principles and practices, basic record keeping, communication and reporting procedures.
OHS policies and procedures may relate to:	Hazard identification, following safety regulations, safety training, safety systems incorporating: <ul style="list-style-type: none"> - work clearance procedures - chemical handling - use of protective equipment and clothing
Personal protective clothing and equipment may include:	Masks, safety glasses, head and hand protection, ear protection, safety boots, gloves, apron, first aid kit.
Safe operating practices may include:	Working safely around chemicals and industrial materials, working safely around tools and equipment, hazard recognition, emergency and first aid procedures.

Evidence guide**Assessment context**

This unit may be assessed on the job, off the job, or a combination of on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. Assessment should be conducted in an environment that the individual is familiar with.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: -

Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with constructing jewellery components or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 19.17A A Fabricate jewellery items

Band – Specialisation band A

Field – Jewellery & horological

Unit Weight 6

This unit covers the skills and knowledge required to construct jewellery components, single and multiple-piece items involving a range of fabrication processes and techniques.

Pre-requisite units - Path 1

5.6A Perform brazing and/or silver soldering

6.7A Perform basic incidental heat/quenching, tempering and annealing

9.1A Draw and interpret sketch

18.1A Use hand tools

Element 19.17A.1 Identify fabrication requirements

Criteria 19.17A.1.1

Item design characteristics, dimensions, construction, composition and finish are established from appropriate sources in accordance with organisational and client requirements.

Assessor guide: observe that –

Relevant information and specifications are gathered by appropriate means, including visual inspection and measurement, job documentation, discussions with client and other appropriate personnel. Specifications for fabrication could relate to metal composition, component parts, dimensions and features.

Assessor guide: confirm that –

Metals and materials for fabricating a range of jewellery items/designs can be given. Common jewellery design features, constructions and finishes can be given.

Criteria 19.17A.1.2

Fabrication and finish specifications and required outcomes are confirmed and clarified as necessary with appropriate person(s) and in accordance with organisational requirements.

Assessor guide: observe that –

Item design, material composition, dimensions and specifications is checked against verbal/written instructions, jewellery illustrations and samples as necessary.

Assessor guide: confirm that –

Appropriate person(s) can be identified.

Criteria 19.17A.1.3

Appropriate preparation and fabrication techniques are established in accordance with item construction, verbal and written specifications, organisational requirements and personal abilities.

Assessor guide: observe that –

Fabrication alternatives are identified, where available, and the most efficient/effective approach clarified and confirm with appropriate person (s).

Assessor guide: confirm that –

Metal preparation and fabrication techniques to suit different design requirements can be given. Personal limitations in relation to preparation and fabrication techniques can be given. Factors affecting the selection of preparation and fabrication methods can be given.

Criteria 19.17A.1.4

Fabrication and finishing activities are prioritised in accordance with designated timeframes, organisational and specific fabrication requirements.

Assessor guide: observe that –

Individual steps, stages and activities for producing the given item are identified and prioritised for effective and timely completion.

Assessor guide: confirm that –

Organisational requirements for fabrication activities can be given.

Element 19.17A.2 Prepare materials for fabrication**Criteria 19.17A.2.1**

Components, materials and consumables are selected/obtained in accordance with organisational requirements and in consultation with appropriate person(s).

Assessor guide: observe that –

Materials and consumables are checked for appropriate condition and quality. Organisational procedures for obtaining materials and resources are followed.

Assessor guide: confirm that –

Metals, materials and consumables for given jewellery fabrication jobs can be identified.

Criteria 19.17A.2.2

Metals are alloyed to specified quality, as required.

Assessor guide: observe that –

Materials are weighed and measured correctly. Correct ratios are used to produce required properties/metal composition. Applicable ingot moulds are selected and used as required. Metals are produced to correct ratios and qualities.

Assessor guide: confirm that –

Properties and characteristics of applicable metals can be given. Ratios to create required grade/quality/composition of metals can be given. Melting temperatures and preparation methods for melting applicable metals can be given. Types of ingot moulds and their characteristics/applications can be given.

Criteria 19.17A.2.3

Metals are rolled/drawn down/cut to required dimensions. Metals are annealed as appropriate. Final shape conforms to required dimensions.

Assessor guide: observe that –

Metals are annealed as appropriate. Final shape conforms to required dimensions.

Assessor guide: confirm that –

Methods, applications, equipment types and operational requirements for rolling and drawing metals can be given. Process for annealing metals to prevent work hardening can be given.

Criteria 19.17A.2.4

Tools and equipment are selected and used appropriate to job requirements and checked for operational effectiveness in accordance with manufacturer's specifications and organisational procedures.

Assessor guide: observe that –

Appropriate tools and equipment are selected for required outcomes. Tools are checked and used safely and effectively.

Assessor guide: confirm that –

Procedures for checking serviceability of applicable tools and equipment can be given. Safe operating procedure for applicable tools and equipment can be given.

Criteria 19.17A.2.5

Material preparation is conducted using safe operating practices and protective equipment, in accordance with OHS and organisational requirements.

Assessor guide: observe that –

Appropriate personal protective equipment is selected, used and maintained correctly. Safe work practices are followed.

Assessor guide: confirm that –

Applicable safe work practices and protective equipment can be given.

Element 19.17A.3 Fabricate jewellery item**Criteria 19.17A.3.1**

Tools and equipment for fabrication are selected and used appropriate to job requirements and checked for operational effectiveness in accordance with manufacturer's specifications and organisational procedures.

Assessor guide: observe that –

Tools and equipment are selected appropriate to required outcomes. Tools are checked and used safely and effectively.

Assessor guide: confirm that –

Procedures for checking serviceability of applicable tools and equipment can be given. Safe operating procedure for applicable tools and equipment can be given.

Criteria 19.17A.3.2

Applicable fabrication activities are performed using safe operating practices and protective equipment, and in accordance with OHS, organisational and industry accepted methods.

Assessor guide: observe that –

Appropriate personal protective equipment is selected, used and maintained correctly. Safe work practices are followed. Organisational and industry accepted fabrication procedures, practices and methods are followed.

Assessor guide: confirm that –

Safe work practices and protective equipment can be given. Applicable fabrication techniques and processes can be given.

Criteria 19.17A.3.3

Item construction conforms with required specifications, quality, organisational and applicable industry standards.

Assessor guide: observe that –

Item is checked and adjusted as necessary for conformance with required dimensions, construction, composition and adjustments, in keeping with organisation customer service, quality and work standards.

Assessor guide: confirm that –

Organisation customer service, quality and work standards can be given. Accepted industry standards of quality can be given.

Element 19.17A.4 Finish jewellery items**Criteria 19.17A.4.1**

The appropriate surface finish is produced to required specifications in accordance with organisational requirements.

Assessor guide: observe that –

Items are embellished and/or polished at appropriate stages during fabrication and final finish process. Scratches and other imperfections are removed to specifications. Adjustments and rectifications identified during finishing are carried out as necessary.

Assessor guide: confirm that –

Tools, techniques and materials for embellishing and polishing can be given.

Criteria 19.17A.4.2

Tools and equipment for embellishing and polishing are selected and used appropriate to job requirements and checked for operational effectiveness in accordance with manufacturer's specifications and organisational procedures.

Assessor guide: observe that –

Tools and equipment are selected appropriate to required outcomes. Tools are checked and used safely and effectively.

Assessor guide: confirm that –

Procedures for checking serviceability of applicable tools and equipment can be given. Safe operating procedure for applicable tools and equipment can be given.

Element 19.17A.5 Complete fabrication**Criteria 19.17A.5.1**

Finished item is packaged/presented and stored safely in accordance with organisational requirements.

Assessor guide: observe that –

Organisational packaging/presentation and storage procedures are applied.

Assessor guide: confirm that –

Organisation procedures for storage and packaging/presentation of finished items can be given. Security measures for protection of jewellery items can be given.

Criteria 19.17A.5.2

Documentation is accurately completed and processed in accordance with organisational requirements and standards.

Assessor guide: observe that –

Procedures for completing and processing documentation are followed. Information is checked for accuracy.

Assessor guide: confirm that –

Work performed, material use, future actions required and other relevant information can be given.

Criteria 19.17A.5.3

Notification of work completion is made to appropriate person(s) in accordance with organisational procedures.

Assessor guide: observe that –

Required person(s) are notified and supporting information relevant to work is given as appropriate.

Assessor guide: confirm that –

Appropriate person(s) for notification can be identified.

Criteria 19.17A.5.4

Work area, tools and equipment are cleaned and stored in accordance with OHS and organisational requirements.

Assessor guide: observe that –

Work area is cleaned to the required standard. Tools and equipment are cleaned and stored safely.

Assessor guide: confirm that –

Organisational requirements for cleaning and storage can be given.

Criteria 19.17A.5.5

Unused/excess materials are collected and stored/reclaimed in accordance with organisational and requirements.

Assessor guide: observe that –

Assessor guide: confirm that –

Organisation procedures for reclamation and storage of materials can be given.

Range statement

This unit covers the skills and knowledge required to construct jewellery components, single and multiple-piece items involving a range of fabrication processes and techniques. It requires the ability to use jewellery tools and equipment and safe and efficient work practices to identify fabrication requirements, prepare materials/manufacture components for fabrication and fabricate and finish items. This work would be carried out autonomously or in a team environment, under occasional supervision, within organisational guidelines and to accepted industry standards.

If electroplating skills are required, Unit 8.3A (Perform electroplating operations) should also be selected.

Range Name**Description**

Items may include:	Components, single and multiple-piece items involving a range of fabrication processes and techniques.
Indicative forming methods are:	Cutting, folding, bending, curving, dapping, drawing, rolling, doming, annealing, melting, granulation.
Indicative joining methods are:	Primarily by brazing/silver soldering but may include other methods such as riveting
Indicative finishing processes are:	Filing, emery finishing, high and satin polish, various embellishment finishes (sandblasting, brushed, burring, reticulation, burnishing etc.)
Tools and equipment may include:	Compass, dividers, rules, vernier calipers, spring gauges, squares, piercing saw, files, drill press/pedestal drill, heating, melting and annealing equipment, polishing equipment and compounds, ultrasonic cleaner.
Metals and consumables may include:	Silver, gold, brass, copper, solders and fluxes, drills and blades, polishing compounds, cleaning and finishing materials, adhesives.
Level of supervision may include:	Autonomously or in a team environment, occasional supervision
Instructions may include:	Instructions from supervisor/management, colleagues, client, job packet.
Appropriate persons may include:	Supervisors/managers, colleagues, client, supplier, technical expert.
Client may include:	Owner, supervisor/manager, external customer, supplier.
Social and cultural differences maybe expressed in:	Language, traditional practices and observations, beliefs, values, practices, symbols, design artefacts, food, diet, dress, religious and spiritual observances, social differences may be conventions and customs, cultural stereotypes, conventions of gender/sexuality.
Organisational requirements may relate to:	Organisational operational policies, standard operating procedures and work methods, organisational goals, objectives, plans, systems and processes, security measures, induction and training materials, client and organisational confidentiality requirements, employer and employee rights and responsibilities , own role, responsibility and delegation, quality and continuous improvement processes and standards, client service standards, defined resource parameters, OHS policies, procedures and programs, emergency and evacuation procedures, duty of care, code of conduct, code of ethics , access and equity policy, principles and practice, record keeping, communication and reporting procedures.
OHS policies and procedures may relate to:	Hazard identification, administering safety regulations, safety training, safety systems incorporating: work clearance procedures, chemical handling, use of protective equipment and clothing, codes of practice.
Personal protective clothing and equipment may include:	Masks, safety glasses, head and hand protection, ear protection, safety boots, gloves, apron, clothing, first aid kit.
Safe operating practices may relate to:	Working safely around chemicals and industrial materials, working safely around tools and equipment, hazard recognition, emergency and first aid procedures.
Documentation may include:	Job packet, work instructions and procedures, parts and components reference material, materials and consumables used, time and record sheets.

Evidence guide**Assessment context**

This unit may be assessed on the job, off the job, or a combination of on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. Assessment should be conducted in an environment that the individual is familiar with.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with fabricating jewellery items or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 19.18A A Repair jewellery items

Band – Specialisation band A

Field – Jewellery & horological

Unit Weight 6

This unit covers the skills and knowledge required to carry out repairs to a range of jewellery items. It requires the ability to use safe and efficient work practices to identify the condition of the item, establish repair requirements and complete and finalise the repair work. This work would be carried out autonomously or in a team environment, under minimal supervision and within organisational guidelines.

Note - This unit has dual status and is to be regarded as both a Specialisation band A unit and Specialisation band B unit for progression to C5 (AQF level V)

Pre-requisite units - Path 1

5.6A Perform brazing and/or silver soldering
18.2A Use power tools/hand held operations
19.16A Construct jewellery components

13.3A Work safely with industrial chemicals and materials
19.1A Jewellery metal casting
19.17A Fabricate jewellery items

18.1A Use hand tools
19.3A Handle gem materials (basic)

Element 19.18A.1 Assess item condition

Criteria 19.18A.1.1

Item characteristics, construction and composition are identified from appropriate sources in accordance with organisational requirements.

Assessor guide: observe that –

Relevant information is gathered by appropriate means, including visual inspection and measurement, job documentation, discussions with client and other appropriate personnel.

Assessor guide: confirm that –

Construction methods and types can be given. Components and materials in given items can be identified. Tools and techniques for establishing condition of items can be given.

Criteria 19.18A.1.2

Personal limitations in assessing item condition are identified and assistance is sought from appropriate sources in accordance with organisational procedures.

Assessor guide: observe that –

Unusual or unfamiliar aspects in design, construction or materials are identified and assistance sought from appropriate sources.

Assessor guide: confirm that –

Appropriate sources of assistance can be given.

Criteria 19.18A.1.3

Condition of item and nature/extent of damage is verified in accordance with organisational procedures, established inspection techniques and original specifications.

Assessor guide: observe that –

Wear, scratching, breakage, missing components and other damage is identified.

Assessor guide: confirm that –

Appropriate inspection and measurement techniques can be given.

Element 19.18A.2 Establish repair requirements and materials

Criteria 19.18A.2.1

Repair requirements, options and recommended actions are established in accordance with organisational requirements and factors impacting on feasibility of repair.

Assessor guide: observe that –

Alternative options are identified, where available. Assistance/verification is sought from other appropriate person(s) as necessary.

Assessor guide: confirm that –

Factors impacting on feasibility of repairs can be given, including item condition, available materials, complexity of repair, time.

Criteria 19.18A.2.2

Recommended repairs and options are conveyed to client and required repair work confirmed, in accordance with organisational requirements.

Assessor guide: observe that –

Options, factors impacting on feasibility of repairs and recommended actions are conveyed clearly to client. Agreed repair and replacement requirements are confirmed and clarified.

Assessor guide: confirm that –

Criteria 19.18A.2.3

Appropriate repair techniques are selected in accordance with item construction/condition and identified repair requirements.

Assessor guide: observe that –

Assessor guide: confirm that –

Criteria 19.18A.2.4

Replacement components are obtained and/or manufactured in accordance with organisational requirements and in consultation with appropriate person(s).

Assessor guide: observe that –

Appropriate type/quantity of metals, stones and other are calculated/estimated. Requirement for replacement or repair of specific components is determined in consultation with appropriate person(s), as necessary.

Assessor guide: confirm that –

Quantities of metal can be calculated/estimated. Features and dimensions of required components can be given. Factors affecting the decision to replace or repair components can be given (e.g. wear, cost, availability of parts, complexity of repair, functionality etc.)

Criteria 19.18A.2.5

Unavoidable damage caused by repair technique is identified and measures to remove or protect existing components/subassemblies are established.

Assessor guide: observe that –

Assemblies are dismantled and components removed as appropriate.

Assessor guide: confirm that –

Methods for protecting components/subassemblies during repair can be given. Situations where unavoidable damage may occur can be given.

Element 19.18A.3 Carry out repairs**Criteria 19.18A.3.1**

Unforeseen conditions/effects of the repair work are identified and appropriate actions taken in accordance with organisational requirements.

Assessor guide: observe that –

Unforeseen conditions are identified and conveyed to appropriate person/s, if necessary. Corrective actions are clarified and agreed with appropriate person/s.

Assessor guide: confirm that –

Effects of various repair techniques on items can be given.

Criteria 19.18A.3.2

Tools, equipment, materials and consumables are selected and used appropriate to job requirements and checked for operational effectiveness in accordance with manufacturer's specifications and organisational procedures.

Assessor guide: observe that –

Materials and consumables are checked for conformity/compatibility to workpiece. Tools are checked and used safely and effectively.

Assessor guide: confirm that –

Tools, equipment, materials and consumables for jewellery repair can be identified and their uses given. Checks for condition and safety can be given.

Criteria 19.18A.3.3

All work is conducted using safe operating practices and protective equipment, in accordance with OHS and organisational requirements.

Assessor guide: observe that –

Appropriate personal protective equipment is selected, used and maintained correctly. Safe work practices are followed.

Assessor guide: confirm that –

Safe work practices and protective equipment can be given.

Criteria 19.18A.3.4

Evidence of the repair/repair area is minimised.

Assessor guide: observe that –

Visible solder is minimised, joints and other moving parts work smoothly, replacement components are matched to original dimensions and finish.

Assessor guide: confirm that –

Importance of minimising evidence of repair can be given.

Criteria 19.18A.3.5

Repaired item conforms with original specifications and/or identified customer requirements.

Assessor guide: observe that –

Item is checked for conformance with required dimensions, function, construction, composition and finish. Adjustments are made to ensure conformance to required specifications in keeping with organisation customer service, quality and workmanship standards.

Assessor guide: confirm that –

Organisation customer service, quality and workmanship standards can be given.

Element 19.18A.4 Finalise repair**Criteria 19.18A.4.1**

Finished item is packaged/presented and stored safely in accordance with organisational requirements.

Assessor guide: observe that –

Organisational packaging/presentation and storage procedures are applied.

Assessor guide: confirm that –

Organisation procedures for storage and packaging/presentation of finished repairs can be given. Security measures for protection of jewellery items can be given.

Criteria 19.18A.4.2

Repair work is documented and confirmed with appropriate person(s) in accordance with organisational procedures.

Assessor guide: observe that –

Information relevant to the repair is accurately documented. The repair is confirmed with appropriate person(s).

Assessor guide: confirm that –

Repairs performed, material use, future actions required and other relevant information can be given. Documentation procedures can be given.

Criteria 19.18A.4.3

Work area, tools and equipment are cleaned and stored in accordance with OHS and organisational requirements.

Assessor guide: observe that –

Work area is cleaned to the required standard. Tools and equipment are cleaned and stored safely.

Assessor guide: confirm that –

Organisational requirements for cleaning and storage can be given.

Criteria 19.18A.4.5

Unused/excess materials are collected and stored/reclaimed in accordance with organisational and requirements.

Assessor guide: observe that –

Assessor guide: confirm that –

Organisation procedures for reclamation and storage of materials can be given.

Range statement

This unit covers the skills and knowledge required to carry out repairs to a range of jewellery items. It requires the ability to use safe and efficient work practices to identify the condition of the item, establish repair requirements and complete and finalise the repair work. This work would be carried out autonomously or in a team environment, under minimal supervision and within organisational guidelines.

If an estimate or quotation for repair is produced, then Unit PRSTS317A (Provide estimate and quote) should also be selected. If jewellery setting is required then Unit 19.7A (Perform gemstone setting) should also be selected. If replacement components need to be manufactured for the repair, then the appropriate units should also be selected.

Range Name**Description**

Instructions may include:	Instructions from supervisor/management, job packet, specific client requirements, reporting and documentation requirements, budget allocations
Appropriate persons may include:	Clients, supervisors/managers/suppliers, technical experts, colleagues.
Organisational requirements may relate to:	Organisational operational policies, procedures and work methods, organisational goals, objectives, plans, systems and processes, security systems and measures, operations manuals, induction and training materials, client and organisational confidentiality requirements, employer and employee rights and responsibilities, own role, responsibility and delegation, quality and continuous improvement processes and standards, client service standards, defined resource parameters, OHS policies, procedures and programs, emergency and evacuation procedures, duty of care, code of conduct, code of ethics, access and equity policy, principles and practice, records and information systems and processes, communication channels and reporting procedures.
Client may include:	Owner, other supplier/jeweller, supervisor/manager.
Interpersonal techniques may include:	Verbal or non-verbal language, two-way interaction, constructive feedback, active listening, questioning to clarify and confirm understanding, interpreting non-verbal and verbal messages, observation techniques, use of positive, confident and co-operative language, control of tone of voice and body language, use of language and concepts appropriate to cultural differences, use of clear presentations of options and consequences, demonstrating flexibility and willingness to compromise.
Social and cultural differences may be expressed in:	Language, traditional practices and observations, beliefs, values, practices, symbols, design artefacts, food, diet, dress, religious and spiritual observances, social conventions and customs, cultural stereotypes, conventions of gender/sexuality
Assessment of repair may involve:	Client, supervisor, colleagues, suppliers.
Indicative of repairs are:	Repairs involving re-sizing, re-shanking, re-tipping, re-shaping, soldering, rivetting and re-fixing. Repair or replacement of components could include gemstones and settings hinges/joints, catches etc.
Materials may include:	Yellow and white gold (au), silver (ag), platinum (pt) and palladium (pd), ferrous and non-ferrous metals.
Consumables may include:	Solders and fluxes, drills and blades, polishing, cleaning and finishing materials.
Tools and equipment may include:	All hand and power tools appropriate to jewellery construction and repair, personal protective equipment
Documentation may include:	Job packet, recommendation for repairs, parts and components replaced, materials and consumables used, timekeeping records.
Items may include:	Chains, bracelets, rings, pendants, broaches, earrings.
OHS policies and procedures may relate to:	Hazardous assessment mechanisms, implementation of safety regulations, safety training, safety systems incorporating: <ul style="list-style-type: none"> - work clearance procedures - chemical handling - use of protective equipment and clothing use of codes of practice
Personal protective clothing and equipment may include:	Masks, safety glasses, head and hand protection, ear protection, safety boots, gloves, first aid kit.

Safe operating practices may include: Working safely around chemicals and industrial materials, working safely around tools and equipment, hazard recognition, emergency and first aid procedures.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. Assessment should be conducted in an environment that the individual is familiar with.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with jewellery repair or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 19.20A A Fault-find and maintain micro-mechanisms

Band – Specialisation band A

Field – Jewellery & horological

Unit Weight 4

This unit covers the competencies required to fault-find and maintain micro-mechanisms

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices
18.2A Use power tools/hand held operations

9.2A Interpret technical drawing
18.55A Dismantle, replace and assemble engineering components

18.1A Use hand tools

Element 19.20A.1 Dismantle components

Criteria 19.20A.1.1

Components are dismantled for inspection

Assessor guide: observe that –

Components are dismantled/removed using appropriate hand towels and techniques Power is removed from the spring. Movement is removed and dismantled Balance assembly is removed and dismantled Bridges, mainspring, barrel, winding mechanism removed/dismantled Procedures to avoid damage to components during disassembly are applied Position/ assembly of components is noted as necessary for re-assembly

Assessor guide: confirm that –

Component parts can be identified, including mainspring, barrel, winding mechanism, electronic circuit, bridges, bearing surfaces, balance assembly, calendar, power source Techniques and procedures for dismantling/removing components can be given

Element 19.20A.2 Verify condition and operation of components

Criteria 19.20A.2.1

Overall condition is assessed

Assessor guide: observe that –

Timepiece is checked for overall condition, damage to case etc.

Assessor guide: confirm that –

Common/typical faults and maintenance requirements can be given for common timepieces

Criteria 19.20A.2.2

Physical condition and operational functioning of components inspected and verified

Assessor guide: observe that –

Components, including movement, are cleaned and prepared for inspection Components are checked for evidence of toxic contamination, pollution, chemical waste and other contaminants identified Operation/function of each component is checked using appropriate tools and techniques and faults identified Defective, damaged or non-serviceable components identified

Assessor guide: confirm that –

Condition/function verified for components of movement including balance assembly, escapement, endshakes, sideshakes, bridges, bearing surfaces, mainspring, barrel, winding mechanism, electronic circuit, freedom of wheel train

Criteria 19.20A.2.3

Faults are identified using appropriate tools and techniques

Assessor guide: observe that –

Standard/routine procedures are followed to locate/identify common faults and maintenance requirements

Assessor guide: confirm that –

Fault-finding procedures can be given Typical faults caused by wear, blockages and other damage and their effects can be given Typical contaminants and their effects on operation/functioning of components can be given, including contaminants and foreign objects

Element 19.20A.3 Carry out maintenance**Criteria 19.20A.3.0**

Components are lubricated to specification

Assessor guide: observe that –

Correct lubricants are used according to manufacturer/design specification Lubricants are applied using appropriate techniques

Assessor guide: confirm that –

Lubricants and lubrication techniques can be given

Criteria 19.20A.3.1

Components are cleaned/replaced and installed as required

Assessor guide: observe that –

Components are cleaned/replaced in correct sequence, using appropriate tools and techniques OHS procedures are applied Components are handled to ensure cleanliness of assembled mechanism

Assessor guide: confirm that –

Cleaning requirements for ensuring correct operation can be given OHS procedures for cleaning and maintenance can be given Techniques/tools for handling and installing components can be given

Element 19.20A.4 Assemble components**Criteria 19.20A.4.1**

Components are assembled to specification

Assessor guide: observe that –

Appropriate tools and techniques are used Components assembled to specification, including, barrel and mainspring, mechanism (movement), canon pinion, drive train, balance assembly, shock resist system, calendar, winding system and other mechanisms

Assessor guide: confirm that –

Tools and techniques for assembling components can be given Safe work practices and safety measures can be given

Element 19.20A.5 Check and adjust components**Criteria 19.20A.5.1**

Components are checked for correct operation

Assessor guide: observe that –

Appropriate tools are used to verify operation of components and assemblies, including barrel, mainspring, cannon pinion, endshake, sideshake, power reserve, drive train, calendar, winding system, power source

Assessor guide: confirm that –

Required checks and procedures for verifying correct operation/function of components can be given

Criteria 19.20A.5.2

Components are adjusted to specification

Assessor guide: observe that –

Components, assemblies/mechanisms adjusted to ensure operation/function to manufacturer specification using appropriate electronic timing and other diagnostic equipment and tools Operational adjustments and verification include regulation, beat error, balance amplitude, rate, power supply,

Assessor guide: confirm that –

Procedures/techniques for adjusting components can be given Operational specification for components and assemblies can be given Tools and equipment (mechanical and electronic) can be given and their use/application given

Range statement

This unit covers the competencies required to fault-find and maintain micro-mechanisms. Work undertaken autonomously or within a team environment using predetermined standards of quality, safety, workplace procedures and accepted workplace techniques/methods.

Range Name	Description
Range of micro-mechanisms	Mechanical and electric watches and clocks of recent manufacture or restoration pieces. May include day/date, automatic winding or generating systems. Clock mechanisms may include alarm, striking and chiming mechanisms.
Range of components	Power source, wheel trains, mechanical oscillating systems, motion work and calendar systems.
Range of checks	Observations of clearances, fits and adjustments, functioning. Operation of systems and performance analysis.
Specific exclusions	Does not extend to ability to adjust indexing system for acoustic resonator watches, chronometer escapements and chronograph mechanisms
Tools and equipment	Includes standard range of mechanical hand tools and electronic equipment to measure amplitude, rate etc.
Safe operating practices may relate to:	Safe use of tools/equipment, chemical cleaning solutions, polishing equipment, application of correct ergonomics.
Specifications may relate to:	Work performed to manufacturer specifications. Recognition of components of product and how quality of component will affect performance
Level of supervision:	Under direct supervision.
Instructions may include:	Instructions from supervisor/management, job packet, specific client requirements, reporting and documentation requirements, budget allocations
Appropriate persons may include:	Clients, supervisors/managers/suppliers, technical experts, colleagues.
Organisational requirements may relate to:	Organisational operational policies, procedures and work methods, organisational goals, objectives, plans, systems and processes, security systems and measures, operations manuals, induction and training materials, client and organisational confidentiality requirements, employer and employee rights and responsibilities, own role, responsibility and delegation, quality and continuous improvement processes and standards, client service standards, defined resource parameters, OHS policies, procedures and programs, emergency and evacuation procedures, duty of care, code of conduct, code of ethics, access and equity policy, principles and practice, records and information systems and processes, communication channels and reporting procedures.
Client may include:	Owner, other supplier/jeweller, supervisor/manager.
Interpersonal techniques may include:	Verbal or non-verbal language, two-way interaction, constructive feedback, active listening, questioning to clarify and confirm understanding, interpreting non-verbal and verbal messages, observation techniques, use of positive, confident and co-operative language, control of tone of voice and body language, use of language and concepts appropriate to cultural differences, use of clear presentations of options and consequences, demonstrating flexibility and willingness to compromise.
Social and cultural differences may be expressed in:	Language, traditional practices and observations, beliefs, values, practices, symbols, design artefacts, food, diet, dress, religious and spiritual observances, social conventions and customs, cultural stereotypes, conventions of gender/sexuality
Documentation may include:	Job packet, recommendation for repairs, parts and components replaced, materials and consumables used, timekeeping records.
OHS policies and procedures may relate to:	Hazardous assessment mechanisms, implementation of safety regulations, safety training, safety systems incorporating: <ul style="list-style-type: none"> - work clearance procedures - chemical handling - use of protective equipment and clothing use of codes of practice
Personal protective clothing and equipment may include:	Masks, safety glasses, head and hand protection, ear protection, safety boots, gloves, first aid kit.

Safe operating practices may include: Working safely around chemicals and industrial materials, working safely around tools and equipment, hazard recognition, emergency and first aid procedures.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. Assessment should be conducted in an environment that the individual is familiar with.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with fault-finding and maintenance of micro-mechanisms or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 19.21A A Diagnose and service micro-mechanisms

Band – Specialisation band A

Field – Jewellery & horological

Unit Weight 6

This unit covers the competencies required to diagnose and service micro-mechanisms, including clocks and watches

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices

18.2A Use power tools/hand held operations

9.2A Interpret technical drawing

18.55A Dismantle, replace and assemble engineering components

18.1A Use hand tools

19.20A Fault-find and maintain micro-mechanisms

Element 19.21A.1 Identify performance requirements for servicing

Criteria 19.21A.1.1

Features and performance characteristics of timepiece are identified

Assessor guide: observe that –

Features and performance characteristics are identified by critical observation of materials/design/finish. Movement type identified correctly

Assessor guide: confirm that –

Methods/media for identifying performance characteristics can be given

Criteria 19.21A.1.2

Performance problems are identified

Assessor guide: observe that –

Typical performance problems and special servicing requirements for given mechanism are identified

Assessor guide: confirm that –

Reasons for specific performance problems/faults can be given e.g. wear, broken parts, fatigue, knocking. Faults in design or materials and special servicing requirements can be identified

Element 19.21A.2 Diagnose faults and servicing requirements

Criteria 19.21A.2.1

Overall condition of timepiece is assessed

Assessor guide: observe that –

Missing/damaged components are identified. Remedial action is determined. Casing components assessed for wear/damage or missing parts

Assessor guide: confirm that –

Timepiece is assessed for general condition such as obvious damage, contaminants, rust etc.

Criteria 19.21A.2.2

Replacement parts are sourced

Assessor guide: observe that –

Parts and movement catalogues interpreted and replacement parts identified. Originality of components is ensured where possible

Assessor guide: confirm that –

Interchangeability of parts for specific timepiece can be given

Criteria 19.21A.2.3

Servicing requirements are established

Assessor guide: observe that –

Sequence required for servicing is determined with reference to available parts, design of product, nature of servicing requirement All aspects of repair costing including provision for replacement parts Most appropriate procedure/s to replace, rectify, repair faults is identified with respect to cost, availability of parts, performance outcomes, integrity/originality of mechanisms, time, customer requirements etc.

Assessor guide: confirm that –

Factors affecting sequence/process for servicing can be given

Criteria 19.21A.2.4

Performance problems are diagnosed

Assessor guide: observe that –

Standard checks are applied to assemblies and subassemblies, balance assembly, escapement, wheel train, motion work, power source (mainspring), calendar, winding and setting mechanisms Checks are made for correct tensioning, functioning, cleanliness, clearances/tolerances, wear and damage Functioning of additional mechanisms verified e.g. auto-winding, generating systems, calendar mechanisms Faults affecting performance are identified

Assessor guide: confirm that –

Techniques, tools and diagnostic equipment for diagnosing and identifying performance problems can be given

Element 19.21A.3 Service micro-mechanisms**Criteria 19.21A.3.1**

Components are dismantled and cleaned to specification can

Assessor guide: observe that –

Special cleaning advice, documentation and diagrams from manufacturer is followed

Assessor guide: confirm that –

Techniques for dismantling assemblies and subassemblies be given

Criteria 19.21A.3.2

Requirements for new components are identified

Assessor guide: observe that –

Assessor guide: confirm that –

Criteria 19.21A.3.3

Components are refinished/replaced as required

Assessor guide: observe that –

Tarnished, corroded components are refinished e.g. pivots

Assessor guide: confirm that –

Operation of equipment for refinishing pivots/ bearing replacement can be given

Criteria 19.21A.3.4

Components are assembled and lubricated to specification

Assessor guide: observe that –

Correct lubricant is selected and applied based on materials used and torque requirements Assemblies and subassemblies correctly assembled to specification and standard procedure

Assessor guide: confirm that –

Techniques and procedures for assembling components, assemblies and subassemblies can be given Application and use of different lubricants can be given

Criteria 19.21A.3.5

Components finished and adjusted to specification

Assessor guide: observe that –

Appearance parts fitted correctly Water resistance of completed watch is evaluated. Appropriate method of testing water resistance is selected Timekeeping is adjusted to tolerance Workshop evaluation of running performance of timepiece is verified using correct tools and equipment

Assessor guide: confirm that –

Correct alignment of hands relating to date change mechanism and dial graduations can be given Timekeeping requirements can be given

Range statement

This unit covers the competencies required to diagnose and service micro-mechanisms. Work undertaken autonomously or within a team environment using predetermined standards of quality, safety, workplace procedures and accepted workplace techniques/methods. This unit includes procurement and fitting of replacement parts. It also includes adjustment and checking to achieve timekeeping and water resistance of completed timepieces to specification/tolerance. If manufacturing of parts is required, the appropriate machining units should also be selected.

Range Name**Description**

Range of micro-mechanisms may include:	Mechanical and electric watches and clocks of recent manufacture or restoration pieces. May include day/date, automatic winding or generating systems. Clock mechanisms may include alarm, striking and chiming mechanisms.
Range of components may include:	Power source, wheel trains, mechanical oscillating systems, motion work and calendar systems.
Range of checks may include:	Observations of clearances, fits and adjustments, functioning. Operation of systems and performance analysis.
Specific exclusions relate to:	Chronometers, precision adjusting and complex mechanisms. Excludes servicing of timekeeping elements.
Tools and equipment may include:	Includes range of mechanical hand tools and electronic equipment for diagnosis and servicing.
OH & S policies and procedures may relate to:	Safe use of tools/equipment, chemical cleaning solutions, polishing equipment, application of correct ergonomics.
Personal protective clothing and equipment may include:	Masks, safety glasses, head and hand protection, ear protection, safety boots, gloves, first aid kit.
Safe operating practices may relate to:	Working safely around chemicals and industrial materials, working safely around tools and equipment, hazard recognition, emergency and first aid procedures.
Specifications may relate to:	Manufacturer specifications. Recognition of components of product and how quality of component and materials will affect performance
Documentation may include:	Job packet, recommendation for repairs, parts and components replaced, materials and consumables used, timekeeping records.
Instructions may include:	Written or verbal instructions from supervisor/management, job packet, customer/client.
Level of supervision may include:	Autonomously or in a team environment, regular supervision.
Appropriate persons may include:	Supervisors/managers, colleagues, client, supplier, technical expert.
Client may include:	Owner, supervisor/manager.
Social and cultural differences may be expressed in:	Language, traditional practices and observations, beliefs, values, practices, symbols, design artefacts, food, diet, dress, religious and spiritual observances, social conventions and customs, cultural stereotypes, conventions of gender/sexuality.
Organisational requirements may relate to:	Organisational operational policies, procedures and work methods, organisational goals, objectives, plans, systems and processes, security systems and measures, operations manuals, induction and training materials, client and organisational confidentiality requirements, employer and employee rights and responsibilities, own role, responsibility and delegation, quality and continuous improvement processes and standards, client service standards, defined resource parameters, OHS policies, procedures and programs, emergency and evacuation procedures, duty of care, code of conduct, code of ethics, access and equity policy, principles and practice, records and information systems and processes, communication channels and reporting procedures.

Evidence guide**Assessment context**

This unit may be assessed on the job, off the job, or a combination of on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. Assessment should be conducted in an environment that the individual is familiar with.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with fault-finding and maintenance of micro-mechanisms or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 19.22A A Perform precision micro-mechanism diagnosis and servicing

Band – Specialisation band A

Field – Jewellery & horological

Unit Weight 6

This unit covers the competencies required to diagnose and service precision micro-mechanisms including chronometer watch and clock components to achieve performance to original specifications.

Note - This unit has dual status and is to be regarded as both a Specialisation band A unit and Specialisation band B unit for progression to C5 (AQF level V)

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices
12.3A Precision mechanical measurement
18.3A Use tools for precision work

7.5A Perform general machining
18.1A Use hand tools
18.55A Dismantle, replace and assemble engineering components

9.2A Interpret technical drawing
18.2A Use power tools/hand held operations
19.20A Fault-find and maintain micro-mechanisms

19.21A Diagnose and service micro-mechanisms

Element 19.22A.1 Adjust timing of precision micro-mechanisms

Criteria 19.22A.1.1

Data for precision timing is analysed and interpreted

Assessor guide: observe that –

Physical limitations and condition of system and control factors influencing isochronism are identified and taken into account when timing

Assessor guide: confirm that –

Inherent influences in design, internal and external influences on rating variation can be given

Criteria 19.22A.1.2

Compensation/adjustment is made to achieve a constant rate

Assessor guide: observe that –

Effects of internal external/external influences are eliminated/minimised Judgement is applied as to adequacy of accuracy Timing adjustments include balance spring, dynamic poising, static poising, truing balance (flat and round)

Assessor guide: confirm that –

Adjustment procedures/techniques can be given

Element 19.22A.2 Diagnose precision micro-mechanisms

Criteria 19.22A.2.1

Detailed inspection techniques are applied to diagnose and identifying performance faults, condition and servicing requirements

Assessor guide: observe that –

Detailed observations are carried out using high-magnification optics Functioning of components is tested to high tolerances including the functioning of escapement and oscillating system

Assessor guide: confirm that –

Detailed inspection and analysis techniques for diagnosing precision micro-mechanisms can be given Acceptable tolerances, clearances and limits for precision components can be given

Criteria 19.22A.2.2

High tolerance equipment is handled and used correctly

Assessor guide: observe that –

Assessor guide: confirm that –

Element 19.22A.3 Carry out precision micro-mechanism servicing**Criteria 19.22A.3.1**

Precision components replaced as appropriate

Assessor guide: observe that –

Assembly and subassembly components removed and replaced including balance staff, pallet staff, pallet jewels and other precision components

Assessor guide: confirm that –

Components suitable for precision outcomes can be identified

Criteria 19.22A.3.2

Components adjusted to precision tolerances

Assessor guide: observe that –

Pallet jewels, safety action of escapement, poise of balance, manipulation of balance spring adjusted to minimise error in performance

Assessor guide: confirm that –

Effects of adjustment on performance and operation can be given Criteria for correct adjustment of balance spring and regulating system can be given

Element 19.22A.4 Repair and adjust chronograph mechanisms**Criteria 19.22A.4.1**

Functional elements adjusted

*Assessor guide: observe that –*Chronograph wheel and minute wheel correctly tensioned
Depth of engagement and operating sequence of functioning elements observed and adjusted Lubrication applied as appropriate Correct alignment of hands with dial graduations is ensured*Assessor guide: confirm that –*

Types of chronograph mechanisms and their functioning can be identified Correct adjustment procedures for chronograph operation, including minute and hour recording systems can be given

Criteria 19.22A.4.2

Chronograph components are examined and re-finished as required

Assessor guide: observe that –

Components are re-finished and matched to existing components to ensure correct functioning New and repaired components fitted and adjusted to function within existing system

Assessor guide: confirm that –

Range statement

This unit covers the competencies required to diagnose and service precision micro-mechanisms including chronometer watch and clock components to achieve performance to original specifications. Work undertaken autonomously or within a team environment using predetermined standards of quality, safety, workplace procedures and accepted workplace techniques/methods. The unit includes precision adjustment and testing to achieve timekeeping and water resistance of completed timepieces to minimise error in performance within specification/tolerance. If manufacturing of parts is required, the appropriate machining units should also be selected.

Range Name	Description
Range of micro-mechanisms	Mechanical and electric precision watches and clocks of recent manufacture or restoration pieces. Includes chronometer timepieces. May include day/date, automatic winding or generating systems. Clock mechanisms may include alarm, striking and chiming mechanisms.
Range of components	Timekeeping elements, including balance staff, pallet staff, pallet jewels, wheel trains and other precision components. Power source, mechanical oscillating systems, motion work, calendar systems.
Range of checks and tests	Observations of high-tolerance clearances, fits and adjustments and functioning. Operation of systems and performance analysis.
Range of repairs and adjustments	Repairs and timing adjustments include balance spring, dynamic poising, static poising, truing balance (flat and round) Repair and adjustment of chronograph mechanisms to ensure correct operation of seconds, minute and hour recording systems
Specific exclusions	
Tools and equipment	Range of precision mechanical/electronic tools and high-tolerance testing equipment for detailed observation diagnosis and servicing. Includes specialist service tools for adjusting oscillating systems and chronograph mechanisms
Safe operating practices may relate to:	Safe use, handling and care of high-tolerance precision tools/equipment.
Specifications may relate to:	Precision adjustment performed to detailed manufacturer specifications and tolerances. Account made of inherent influences in design, internal and external influences on rating variation
Instructions may include:	Instructions from supervisor/management, job packet, specific client requirements, reporting and documentation requirements, budget allocations
Appropriate persons may include:	Clients, supervisors/managers/suppliers, technical experts, colleagues.
Organisational requirements may relate to:	Organisational operational policies, procedures and work methods, organisational goals, objectives, plans, systems and processes, security systems and measures, operations manuals, induction and training materials, client and organisational confidentiality requirements, employer and employee rights and responsibilities, own role, responsibility and delegation, quality and continuous improvement processes and standards, client service standards, defined resource parameters, OHS policies, procedures and programs, emergency and evacuation procedures, duty of care, code of conduct, code of ethics, access and equity policy, principles and practice, records and information systems and processes, communication channels and reporting procedures.
Client may include:	Owner, other supplier/jeweller, supervisor/manager.
Interpersonal techniques may include:	Verbal or non-verbal language, two-way interaction, constructive feedback, active listening, questioning to clarify and confirm understanding, interpreting non-verbal and verbal messages, observation techniques, use of positive, confident and co-operative language, control of tone of voice and body language, use of language and concepts appropriate to cultural differences, use of clear presentations of options and consequences, demonstrating flexibility and willingness to compromise.
Social and cultural differences may be expressed in:	Language, traditional practices and observations, beliefs, values, practices, symbols, design artefacts, food, diet, dress, religious and spiritual observances, social conventions and customs, cultural stereotypes, conventions of gender/sexuality
Assessment of repair may involve:	Client, supervisor, colleagues, suppliers.
Documentation may include:	Job packet, recommendation for repairs, parts and components replaced, materials and consumables used, timekeeping records.

OHS policies and procedures may relate to: Hazardous assessment mechanisms, implementation of safety regulations, safety training, safety systems incorporating:

- work clearance procedures
- chemical handling
- use of protective equipment and clothing
- use of codes of practice

Personal protective clothing and equipment may include: Masks, safety glasses, head and hand protection, ear protection, safety boots, gloves, first aid kit.

Safe operating practices may include: Working safely around chemicals and industrial materials, working safely around tools and equipment, hazard recognition, emergency and first aid procedures.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job, or a combination of on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. Assessment should be conducted in an environment that the individual is familiar with.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with diagnosis and servicing of precision micro-mechanisms or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 24.1A A Perform basic penetrant testing

Band – Specialisation band A

Field – Non-destructive testing

Unit Weight 2

Pre-requisite units - Path 1

18.1A Use hand tools

Element 24.1A.1 Prepare inspection areas for basic penetrant testing

Criteria 24.1A.1.1

Inspection areas are cleaned and prepared for testing using appropriate procedures and materials.

Assessor guide: observe that –

Inspection areas are identified by established techniques. Inspection areas are correctly prepared using the appropriate cleaning materials.

Assessor guide: confirm that –

Cleaning and preparation processes are explained.

Criteria 24.1A.1.2

Preparation processes are carried out in accordance with the relevant procedures and OH&S requirements.

Assessor guide: observe that –

Preparation procedures are carried out correctly OH&S requirements are followed at all times.

Assessor guide: confirm that –

Procedures and OH&S requirements can be explained in relation to the preparation process.

Criteria 24.1A.1.3

Inspection areas are visually assessed and obvious discontinuities identified.

Assessor guide: observe that –

All obvious discontinuities have been identified from a visual inspection.

Assessor guide: confirm that –

Established inspection procedures and techniques are explained. Types of discontinuities are explained and their consequences outlined.

Element 24.1A.2 Perform basic penetrant testing

Criteria 24.1A.2.1

Nominated test is identified from standard operating procedures.

Assessor guide: observe that –

Procedures are interpreted correctly and all relevant information identified.

Assessor guide: confirm that –

The procedure for carrying out penetrant testing can be explained.

Criteria 24.1A.2.2

Test equipment is prepared in accordance with standard operating procedures.

Assessor guide: observe that –

Test equipment is prepared correctly. The procedures for setting up test equipment are demonstrated.

Assessor guide: confirm that –

The tools, equipment, techniques and system verification checks necessary to carry out the penetrant test are explained.

Criteria 24.1A.2.3

Test media is selected and applied in accordance with workplace practices and specifications.

Assessor guide: observe that –

Test media is applied correctly.

Assessor guide: confirm that –

Test media is suitable for type of test and material.

Criteria 24.1A.2.4

Penetrant test is carried out in accordance with relevant work instructions and OH&S requirements.

Assessor guide: observe that –

Basic principles of penetrant testing techniques are applied
The penetrant test is performed correctly and in logical sequence. OH&S requirements are followed at all times.

Assessor guide: confirm that –

Basic principles of penetrant testing can be explained. Limitations and advantages of penetrant testing can be explained. Hazards associated with penetrant testing are identified and safety requirements outlined.

Criteria 24.1A.2.5

Penetrant testing equipment is maintained and stored in accordance with standard operating procedures and OH &S requirements.

Assessor guide: observe that –

Basic maintenance is carried out on test equipment and equipment is stored correctly. OH&S requirements are followed at all times.

Assessor guide: confirm that –

Basic maintenance and storage procedures for testing equipment are explained. OH &S requirements can be explained.

Element 24.1A.3 Report the results of penetrant test(s)**Criteria 24.1A.3.1**

Basic indications are checked and defects identified in accordance with enterprise standards and/or procedures.

Assessor guide: observe that –

Procedure for identifying basic defects is followed.

Assessor guide: confirm that –

Common basic defects are explained.

Criteria 24.1A.3.2

Basic indications are confirmed in accordance with enterprise standards and/or procedures.

Assessor guide: observe that –

Test results are confirmed by other penetrant testing methods or by visual inspections.

Assessor guide: confirm that –

Confirmation of test results is explained in accordance with enterprise standards and/or procedures.

Criteria 24.1A.3.3

Test results are reported in accordance with enterprise standards and/or procedures.

Assessor guide: observe that –

Test results are reported according to standard

Assessor guide: confirm that –

Methods/procedures for reporting test results are explained.

Range statement

This unit describes the underpinning knowledge and skills required to apply basic penetrant testing techniques on fabrications, structures and components across a wide range of industries and restricted to basic visible dye and/or process penetrant line methods. The work can relate to scheduled and un-scheduled maintenance activities, using general tools, specific penetrant testing equipment as specified in maintenance documentation, testing procedures or operators instructions.

Actual and potential defects to be considered, together with ongoing abnormalities in fabrications, components and structures. Penetrant testing is performed on critical component or structural zones. All testing must be completed with particular attention to personal safety and OH&S regulations. Certification against Australian Standards may be achieved where assessment in this unit of competency is carried out in conjunction with an examining authority as described in ISO 9712. Materials and chemicals, which are subject to codes and regulations, for example, chemicals, explosives, solvents, dangerous materials, acids, or noxious waste products safe work habits must be stored and used in accordance with safe work practices.

This unit should not be selected when Unit 24.2A Perform penetrant testing or Unit 15.4A Perform inspection basic has already been selected. Where power tools are required, Unit 18.2A Use power tools/hand held operations should also be selected.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or through a combination of both on and off the job. An individual working alone or as part of a team would demonstrate the competencies covered in this unit. The assessment environment should not disadvantage the candidate.

Assessment conditions

The candidate will be provided with:-

- all tools, equipment, materials and documentation required.

The candidate will be permitted access to the following documents: -

- any relevant workplace procedures;
- any relevant product and manufacturing specifications;
- any relevant codes, standards, manuals and reference materials.

The candidate will be required to:

- orally, or by other methods of communication, answer questions put by the assessor about processes, events or tasks being undertaken;
- identify colleagues who can be approached for the collection of competency evidence, where appropriate;
- present evidence of any off-job training related to this unit
- perform the tasks within the time frames established between the candidates supervisor/instructor and the assessor, prior to the assessment;

Assessors must be satisfied that the candidate can competently and consistently perform all elements of this unit as specified by the criteria, including required knowledge.

Activities should closely simulate a workplace environment and conditions due to the critical nature of this work.

Critical aspects

The candidate should demonstrate sufficient underpinning knowledge of:

- OH&S requirements
- metallurgy associated with the level of application in this unit
- take responsibility for the quality of their own work;

This unit could be assessed in conjunction with other units addressing the safety, quality, communication, materials handling, recording and reporting associated with non-destructive testing in accordance with relevant standards and procedures, or other units requiring the exercise of skills and knowledge covered in this unit.

Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Special notes

During assessment the individual will:

- demonstrate safe working practices at all times;
- communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment;

- plan tasks in all situations and review task requirements as appropriate;
- perform all tasks to specifications and use accepted NDT techniques, practices, processes and workplace procedures;
- tasks will be completed within reasonable time frames relating to typical workplace activities.

Unit MEM 24.2A A Perform penetrant testing

Band – Specialisation band A

Field – Non-destructive testing

Unit Weight 4

Notes - This unit has dual status and is to be regarded as both a Specialisation band A unit and Specialisation band B unit for progression to C5 (AQF level V)

Pre-requisite units - Path 1

18.1A Use hand tools

24.12A Apply metallurgy principles

Element 24.2A.1 Prepare inspection areas for penetrant testing

Criteria 24.2A.1.1

Inspection areas are identified, cleaned and prepared for testing using appropriate procedures and materials.

Assessor guide: observe that –

Inspection areas are identified by established techniques.

Assessor guide: confirm that –

Cleaning and preparation processes can be explained for a range of test surfaces.

Appropriate cleaning materials are selected & applied.

Criteria 24.2A.1.2

Preparation processes are carried out in accordance with the relevant procedures, statutory and OH&S requirements.

Assessor guide: observe that –

Procedures are carried out correctly. Statutory and OH&S requirements are followed.

Assessor guide: confirm that –

Procedure, statutory and OH&S requirements can be explained in relation to the preparation process.

Criteria 24.2A.1.3

Inspection areas are visually assessed and obvious discontinuities identified.

Assessor guide: observe that –

Discontinuities are identified and classified from a visual inspection.

Assessor guide: confirm that –

Established assessment procedures and techniques are explained. Types of discontinuities are explained and their consequences/effect on the material are described.

Element 24.2A.2 Perform penetrant testing

Criteria 24.2A.2.1

The most appropriate penetrant test for the material/application is selected.

Assessor guide: observe that –

Nominated testing method is appropriate regarding:

- * defect type
- * material type and form

Assessor guide: confirm that –

The penetrant testing technique is appropriate for the given situation. Selection of testing method can be justified/explained.

The procedure for carrying out penetrant testing can be explained.

Criteria 24.2A.2.2

Test equipment is selected and prepared in accordance with standards and/or procedures.

Assessor guide: observe that –

Test equipment is set up correctly OH & S precautions are adhered to.

Assessor guide: confirm that –

The tools, equipment, techniques and system verification checks necessary to carry out the penetrant test can be identified.

Criteria 24.2A.2.3

Appropriate test media is selected and applied in accordance with workplace/industry practices.

Assessor guide: observe that –

Correct test media is selected. Test media is applied correctly.

Assessor guide: confirm that –

Test media is suitable for type of test and material.

Criteria 24.2A.2.4

Penetrant test is carried out in accordance with relevant standards, specifications and OH&S requirements.

Assessor guide: observe that –

Principles of penetrant testing techniques are applied. The penetrant test is performed correctly and in logical sequence
OH&S requirements are followed at all times.

Assessor guide: confirm that –

Principles and applications of penetrant testing techniques are explained. Relevant standards are explained. The hazards associated with penetrant testing are identified and appropriate safety requirements outlined.

Criteria 24.2A.2.5

Penetrant test equipment is checked for defects, maintained and stored in accordance with procedures, OH&S requirements and manufacturer instructions.

Assessor guide: observe that –

Appropriate maintenance is carried out on test equipment and equipment is stored correctly. Faulty/unserviceable test equipment is identified.

Assessor guide: confirm that –

Maintenance and storage procedures for test equipment are explained. Common faults and damage can be outlined.

Element 24.2A.3 Interpret and report the results of penetrant test(s)**Criteria 24.2A.3.1**

Indications are assessed and defects detected and classified in accordance with national and international codes and standards.

Assessor guide: observe that –

All relevant defects are detected. Defects are interpreted and classified in terms of national and international codes and standards.

Assessor guide: confirm that –

A range of defects are explained. The meaning and application of national and international codes and standards is explained.

Criteria 24.2A.3.2

Defects are confirmed in accordance with enterprise procedures and industry practices.

Assessor guide: observe that –

Defect indications are confirmed. Test results are confirmed by other penetrant testing methods and/or other NDT methods.

Assessor guide: confirm that –

Confirmation of test results is explained.

Criteria 24.2A.3.3

Test results are reported in accordance with enterprise procedures, accepted industry practices and customer service requirements.

Assessor guide: observe that –

Report is completed correctly and according to procedures.
Test results, implications of results and related information

Assessor guide: confirm that –

Methods/procedures for reporting test results are explained. Implications of test results for the particular material/application are explained. are conveyed to end user.

Range statement

This unit describes the underpinning knowledge and skills required to apply penetrant testing techniques on fabrications, structures and components across a wide range of industries to Level 2 (AS3669 and AS3998) or equivalent by portable penetrant testing, processing on a dedicated penetrant line, visible dye and fluorescent methods. The work can relate to scheduled and un-scheduled maintenance activities, using general tools, specific penetrant testing equipment as specified in maintenance documentation, testing procedures or operators instructions.

Actual and potential defects be considered, together with ongoing abnormalities in fabrications, components, structures and/or aircraft components. Penetrant tests are performed on critical component or structural zones, and may require re-assessment of competency at regular intervals in accordance with Australian Standards and/or other relevant standards. All testing must be completed with particular attention to personal safety and OH&S regulations.. Certification against Australian Standards may be achieved where assessment in this unit of competency is carried out in conjunction with an examining authority as described in ISO 9712. Materials and chemicals, which are subject to codes and regulations, for example, chemicals, explosives, solvents, dangerous materials, acids, or noxious waste products safe work habits must be stored and used in accordance with safe work practices.

This unit should not be selected when Unit 15.4A Perform inspection (basic) or Unit 15.5A Perform inspection (advanced) has already been selected. Where power tools are required, Unit 18.2A Use power tools/hand held operations should also be selected

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or through a combination of both on and off the job. An individual working alone or as part of a team would demonstrate the competencies covered in this unit. The assessment environment should not disadvantage the candidate.

Assessment conditions

The candidate will be provided with:-

- all tools, equipment, materials and documentation required.

The candidate will be permitted access to the following documents: -

- any relevant workplace procedures;
- any relevant product and manufacturing specifications;
- any relevant codes, standards, manuals and reference materials.

The candidate will be required to:

- orally, or by other methods of communication, answer questions put by the assessor about processes, events or tasks being undertaken;
- identify colleagues who can be approached for the collection of competency evidence, where appropriate;
- present evidence of any off-job training related to this unit
- perform the tasks within the time frames established between the candidates supervisor/instructor and the assessor, prior to the assessment;

Assessors must be satisfied that the candidate can competently and consistently perform all elements of this unit as specified by the criteria, including required knowledge.

Activities should closely simulate a workplace environment and conditions due to the critical nature of this work.

Critical aspects

The candidate should demonstrate sufficient underpinning knowledge of:

- OH&S requirements
- metallurgy associated with the level of application in this unit
- take responsibility for the quality of their own work;

This unit could be assessed in conjunction with other units addressing the safety, quality, communication, materials handling, recording and reporting associated with non-destructive testing in accordance with relevant standards and procedures, or other units requiring the exercise of skills and knowledge covered in this unit.

Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Special notes

During assessment the individual will:

- demonstrate safe working practices at all times;
- communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment;
- plan tasks in all situations and review task requirements as appropriate;
- perform all tasks to specifications and use accepted NDT techniques, practices, processes and workplace procedures;
- tasks will be completed within reasonable time frames relating to typical workplace activities.

Unit MEM 24.3A A Perform basic magnetic particle testing

Band – Specialisation band A

Field – Non-destructive testing

Unit Weight 2

Pre-requisite units - Path 1

18.1A Use hand tools

Element 24.3A.1 Prepare inspection areas for basic magnetic particle testing

Criteria 24.3A.1.1

Inspection areas are cleaned and prepared for testing using appropriate procedures and materials.

Assessor guide: observe that –

Inspection areas are identified by established techniques.

Assessor guide: confirm that –

Cleaning and preparation processes are explained.

Inspection areas are correctly prepared using the appropriate cleaning materials.

Criteria 24.3A.1.2

Preparation processes are carried out in accordance with the relevant specifications and OH&S requirements.

Assessor guide: observe that –

Preparation procedures are carried out correctly. OH&S requirements are followed at all times.

Assessor guide: confirm that –

Procedures and OH&S requirements can be explained in relation to the preparation process.

Criteria 24.3A.1.3

Inspection areas are visually assessed and obvious discontinuities identified.

Assessor guide: observe that –

Obvious discontinuities have been identified from a visual inspection.

Assessor guide: confirm that –

Established assessment procedures and techniques are explained.
Types of discontinuities are explained and their consequences outlined.

Element 24.3A.2 Perform basic magnetic particle testing**Criteria 24.3A.2.1**

Nominated 'yoke' or 'bench' magnetic particle testing procedure is identified from standard operating procedures.

Assessor guide: observe that –

Procedures are interpreted correctly and all relevant information identified.

Assessor guide: confirm that –

Basic principles of magnetism are explained.

Appropriateness of testing method for the given situation can be justified/explained.

The procedure for carrying out magnetic particle test using either the 'yoke' or 'bench' can be explained.

Knowledge of basic metallurgy associated with the application is demonstrated.

Criteria 24.3A.2.2

Test equipment is prepared in accordance with relevant standards and/or procedures.

Assessor guide: observe that –

Test equipment is prepared correctly. The procedures for setting up test equipment are demonstrated.

Assessor guide: confirm that –

The tools, equipment, techniques and system verification checks necessary to carry out the magnetic particle test are outlined & explained.

Criteria 24.3A.2.3

Magnetic particle test is carried out in accordance with relevant work instructions and OHS requirements.

Assessor guide: observe that –

Basic principles of magnetism are applied to magnetic particle testing techniques. Relevant procedures and OH&S requirements are observed. The magnetic particle test and demagnetisation has been performed correctly and in logical sequence. OH&S requirements are followed at all times.

Assessor guide: confirm that –

The limitations of magnetic particle testing are explained. The hazards associated with magnetic particle testing are identified and safety precautions outlined.

Criteria 24.3A.2.4

Magnetic particle testing equipment is maintained and stored in accordance with Standard Operating Procedures and OH &S requirements.

Assessor guide: observe that –

Basic maintenance is carried out on test equipment and equipment is stored correctly. OH&S requirements are followed at all times.

Assessor guide: confirm that –

Basic maintenance and storage procedures for testing equipment are explained. OH &S requirements can be explained.

Element 24.3A.3 Report the results of magnetic particle test(s)**Criteria 24.3A.3.1**

Basic indications are checked and defects identified in accordance with enterprise standards and/or procedures.

Assessor guide: observe that –
Procedure for identifying basic defects is followed.

Assessor guide: confirm that –
Common basic defects are explained.

Criteria 24.3A.3.2

Basic indications are confirmed in accordance with enterprise standards and/or procedures.

Assessor guide: observe that –
Test results are confirmed by other magnetic particle test methods.

Assessor guide: confirm that –
Confirmation of test results is explained in accordance with enterprise standards and/or procedures.

Criteria 24.3A.3.3

Test results are reported in accordance with enterprise standards and/or procedures.

Assessor guide: observe that –
Test results are reported according to standard

Assessor guide: confirm that –
Methods/procedures for reporting test results are explained.

Range statement

This unit describes the underpinning knowledge and skills required to apply portable and fixed ('yoke' or 'bench') basic magnetic particle testing techniques on fabrications, structures and components across a wide range of industries. The work can relate to scheduled and un-scheduled maintenance activities, using general tools, specific magnetic testing equipment as specified in maintenance documentation, testing procedures or operators instructions.

Actual and potential defects be considered, together with ongoing abnormalities in fabrications, components and structures. Magnetic particle testing is performed on critical component or structural zones. All testing must be completed with particular attention to personal safety and OH&S regulations. Certification against Australian Standards may be achieved where assessment in this unit of competency is carried out in conjunction with an examining authority as described in ISO 9712. Materials and chemicals, which are subject to codes and regulations, for example, chemicals, explosives, solvents, dangerous materials, acids, or noxious waste products safe work habits must be stored and used in accordance with safe work practices.

This unit should not be selected when Unit 24.4A Perform magnetic particle testing or Unit 15.4A Perform inspection basic has already been selected. Where power tools are required, Unit 18.2A Use power tools/hand held operations should also be selected.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or through a combination of both on and off the job. An individual working alone or as part of a team would demonstrate the competencies covered in this unit. The assessment environment should not disadvantage the candidate.

Assessment conditions

The candidate will be provided with:-

- all tools, equipment, materials and documentation required.

The candidate will be permitted access to the following documents: -

- any relevant workplace procedures;
- any relevant product and manufacturing specifications;
- any relevant codes, standards, manuals and reference materials.

The candidate will be required to:

- orally, or by other methods of communication, answer questions put by the assessor about processes, events or tasks being undertaken;
- identify colleagues who can be approached for the collection of competency evidence, where appropriate;
- present evidence of any off-job training related to this unit
- perform the tasks within the time frames established between the candidates supervisor/instructor and the assessor, prior to the assessment;

Assessors must be satisfied that the candidate can competently and consistently perform all elements of this unit as specified by the criteria, including required knowledge.

Activities should closely simulate a workplace environment and conditions due to the critical nature of this work.

Critical aspects

The candidate should demonstrate sufficient underpinning knowledge of:

- OH&S requirements
- metallurgy associated with the level of application in this unit
- take responsibility for the quality of their own work;

This unit could be assessed in conjunction with other units addressing the safety, quality, communication, materials handling, recording and reporting associated with non-destructive testing in accordance with relevant standards and procedures, or other units requiring the exercise of skills and knowledge covered in this unit.

Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Special notes

During assessment the individual will:

- demonstrate safe working practices at all times;
- communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment;
- plan tasks in all situations and review task requirements as appropriate;
- perform all tasks to specifications and use accepted NDT techniques, practices, processes and workplace procedures;
- tasks will be completed within reasonable time frames relating to typical workplace activities.

Unit MEM 24.4A A Perform magnetic particle testing

Band – Specialisation band A

Field – Non-destructive testing

Unit Weight 4

Notes - This unit has dual status and is to be regarded as both a Specialisation band A unit and Specialisation band B unit for progression to C5 (AQF level V)

Pre-requisite units - Path 1

18.1A Use hand tools

24.12A Apply metallurgy principles

Element 24.4A.1 Prepare inspection areas for magnetic particle testing.

Criteria 24.4A.1.1

Inspection areas are identified, cleaned and prepared for testing using appropriate procedures and materials.

Assessor guide: observe that –

Inspection areas are identified by established techniques. Appropriate cleaning materials are selected & applied.

Assessor guide: confirm that –

Cleaning and preparation processes are explained for a range of test surfaces.

Criteria 24.4A.1.2

Preparation processes are carried out in accordance with the relevant procedures, statutory and OH&S requirements.

Assessor guide: observe that –

Procedures are carried out correctly. Statutory and OH&S requirements are followed.

Assessor guide: confirm that –

Procedure, statutory and OH&S requirements can be explained in relation to the preparation process.

Criteria 24.4A.1.3

Inspection areas are visually assessed and obvious discontinuities identified.

Assessor guide: observe that –

Obvious discontinuities are identified, classified and confirmed from a visual inspection. A primary metallurgical assessment of inspection areas is used to describe primary or manufacturing or service defects.

Assessor guide: confirm that –

Established assessment procedures and techniques are explained. Types of discontinuities are explained and their consequences/effect on the material are described.

Element 24.4A.2 Perform magnetic particle testing

Criteria 24.4A.2.1

The most appropriate magnetic particle test for the material/application is selected.

Assessor guide: observe that –

Nominated testing method is appropriate regarding:

- * Defect type and orientation
- * Part geometry and configuration
- * Magnetism method
- * Particle application

Assessor guide: confirm that –

The magnetic particle testing technique is appropriate for the given situation. Selection of testing method can be justified/explained. The procedure for carrying out magnetic particle test can be explained.

Criteria 24.4A.2.2

Testing equipment is selected and prepared in accordance with standards and/or procedures.

Assessor guide: observe that –

Test equipment is set up correctly. OH & S precautions are adhered to.

Assessor guide: confirm that –

The tools, equipment, techniques and system verification checks necessary to carry out the magnetic particle test can be identified.

The procedures for setting up test equipment can be explained.

Criteria 24.4A.2.3

Magnetic particle test is carried out in accordance with relevant standards, specifications and OH&S requirements.

Assessor guide: observe that –

Principles of magnetic particle testing are applied. The magnetic particle test and demagnetisation is performed correctly and in logical sequence. OH&S requirements are followed at all times.

Assessor guide: confirm that –

Principles and applications of magnetic particle testing are understood and explained. Relevant standards are explained.

The hazards associated with magnetic particle testing are identified and appropriate safety requirements outlined.

Criteria 24.4A.2.4

Magnetic particle testing equipment is checked for defects, maintained and stored in accordance with procedures, OH&S requirements and manufacturer instructions.

Assessor guide: observe that –

Appropriate maintenance is carried out on test equipment and equipment is stored correctly. Faulty/unserviceable testing equipment is identified.

Assessor guide: confirm that –

Maintenance and storage procedures for test equipment are explained. Common faults and damage can be outlined.

Element 24.4A.3 Interpret and report the results of magnetic particle tests**Criteria 24.4A.3.1**

Indications are assessed and defects detected and classified in accordance with national and international codes and standards.

Assessor guide: observe that –

All relevant defects are detected. Defects are interpreted and classified in terms of national and international codes and standards.

Assessor guide: confirm that –

A range of defects are explained. The meaning and application of national and international codes and standards is explained.

Criteria 24.4A.3.2

Defects are confirmed in accordance with enterprise procedures and industry practices.

Assessor guide: observe that –

Defect indications are confirmed. Test results are confirmed by other magnetic particle testing methods and/or other NDT methods.

Assessor guide: confirm that –

Confirmation of test results is explained.

Criteria 24.4A.3.3

Test results are reported in accordance with enterprise procedures, accepted industry practices and customer service requirements.

Assessor guide: observe that –

Report is completed correctly and according to procedures. Test results, implications of results and related information are conveyed to end user.

Assessor guide: confirm that –

Methods/procedures for reporting test results are explained.

Implications of test results for the particular

material/application are explained.

Range statement

This unit describes the underpinning knowledge and skills required to apply magnetic particle testing techniques on fabrications, structures and components across a wide range of industries to Level 2 (AS 3669 and AS 3998) or equivalent. The work can relate to scheduled and un-scheduled maintenance activities, using general tools, specific testing equipment as specified in maintenance documentation, testing procedures or operators instructions.

Actual and potential defects be considered, together with ongoing abnormalities in fabrications, components, structures and/or aircraft components. Magnetic particle testing is performed on critical component or structural zones, and may require re-assessment of competency at regular intervals in accordance with Australian Standards and/or other relevant standards. All testing must be completed with particular attention to personal and OH&S regulations. Certification against Australian Standards may be achieved where assessment in this unit of competency is carried out in conjunction with an examining authority as described in ISO 9712. Materials and chemicals, which are subject to codes and regulations, for example, chemicals, explosives, solvents, dangerous materials, acids, or noxious waste products safe work habits must be stored and used in accordance with safe work practices.

This unit should not be selected when Unit 15.4A Perform inspection (basic) or Unit 15.5A Perform inspection (advanced) has already been selected. Where power tools are required, Unit 18.2A Use power tools/hand held operations should also be selected.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or through a combination of both on and off the job. An individual working alone or as part of a team would demonstrate the competencies covered in this unit. The assessment environment should not disadvantage the candidate.

Assessment conditions

The candidate will be provided with:-

- all tools, equipment, materials and documentation required.

The candidate will be permitted access to the following documents: -

- any relevant workplace procedures;
- any relevant product and manufacturing specifications;
- any relevant codes, standards, manuals and reference materials.

The candidate will be required to:

- orally, or by other methods of communication, answer questions put by the assessor about processes, events or tasks being undertaken;
- identify colleagues who can be approached for the collection of competency evidence, where appropriate;
- present evidence of any off-job training related to this unit
- perform the tasks within the time frames established between the candidates supervisor/instructor and the assessor, prior to the assessment;

Assessors must be satisfied that the candidate can competently and consistently perform all elements of this unit as specified by the criteria, including required knowledge.

Activities should closely simulate a workplace environment and conditions due to the critical nature of this work.

Critical aspects

The candidate should demonstrate sufficient underpinning knowledge of:

- OH&S requirements
- metallurgy associated with the level of application in this unit
- take responsibility for the quality of their own work;

This unit could be assessed in conjunction with other units addressing the safety, quality, communication, materials handling, recording and reporting associated with non-destructive testing in accordance with relevant standards and procedures, or other units requiring the exercise of skills and knowledge covered in this unit.

Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Special notes

During assessment the individual will:

- demonstrate safe working practices at all times;
- communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment;
- plan tasks in all situations and review task requirements as appropriate;
- perform all tasks to specifications and use accepted NDT techniques, practices, processes and workplace procedures;
- tasks will be completed within reasonable time frames relating to typical workplace activities.

Unit MEM 24.5A A Perform basic eddy current testing

Band – Specialisation band A

Field – Non-destructive testing

Unit Weight 2

Pre-requisite units - Path 1

18.1A Use hand tools

Element 24.5A.1 Prepare inspection areas for basic eddy current testing.

Criteria 24.5A.1.1

Inspection areas are cleaned and prepared for testing using appropriate procedures and materials.

Assessor guide: observe that –

Inspection areas are identified by established techniques.

Assessor guide: confirm that –

Cleaning and preparation processes are explained.

Inspection areas are correctly prepared using the appropriate cleaning materials.

Criteria 24.5A.1.2

Preparation processes are carried out in accordance with the relevant procedures and OH&S requirements.

Assessor guide: observe that –

Preparation procedures are carried out correctly OH&S requirements are followed at all times.

Assessor guide: confirm that –

Procedures and OH&S requirements can be explained in relation to the preparation process.

Criteria 24.5A.1.3

Inspection areas are visually assessed and obvious discontinuities identified.

Assessor guide: observe that –

All obvious discontinuities have been identified from a visual inspection.

Assessor guide: confirm that –

Established inspection procedures and techniques are explained.
Types of discontinuities are explained and their consequences outlined.

Element 24.5A.2 Perform basic eddy current testing

Criteria 24.5A.2.1

Nominated test is identified from standard operating procedures.

Assessor guide: observe that –

Procedures are interpreted correctly and all relevant information identified.

Assessor guide: confirm that –

The procedure for carrying out eddy current testing can be explained.

Criteria 24.5A.2.2

Test equipment is prepared in accordance with standards and/or procedures.

Assessor guide: observe that –

Test equipment is prepared correctly. The procedures for setting up test equipment are demonstrated.

Assessor guide: confirm that –

The tools, equipment and techniques and system verification checks necessary to carry out eddy current testing can be identified. The procedures for setting up test equipment can be outlined.

Criteria 24.5A.2.3

Eddy Current test procedure is carried out in accordance with relevant work instructions and OH&S requirements.

Assessor guide: observe that –

Basic principles of electricity, magnetism and electromagnetism in relation to eddy current testing are applied. The test is performed correctly and in logical sequence. OH&S requirements are followed at all times.

Assessor guide: confirm that –

Basic principles of electricity, magnetism, electromagnetism and eddy current testing can be explained. Limitations and advantages of eddy current testing can be explained. Hazards associated with eddy current testing are identified and safety requirements outlined.

Criteria 24.5A.2.4

Eddy current test equipment is maintained and stored in accordance with standard operating procedures and OH &S requirements.

Assessor guide: observe that –

Basic maintenance is carried out on test equipment and equipment is stored correctly. OH&S requirements are followed at all times.

Assessor guide: confirm that –

Basic maintenance and storage procedures for testing equipment are explained. OH &S requirements can be explained.

Element 24.5A.3 Report the results of eddy current test(s)**Criteria 24.5A.3.1**

Basic indications are checked and defects identified in accordance with enterprise standards and/or procedures.

Assessor guide: observe that –

Procedure for identifying basic defects is followed.

Assessor guide: confirm that –

Common basic defects are explained.

Criteria 24.5A.3.2

Basic indications are confirmed in accordance with enterprise standards and/or procedures.

Assessor guide: observe that –

Test results are confirmed by other testing methods or by visual inspections.

Assessor guide: confirm that –

Confirmation of test results is explained in accordance with enterprise standards and/or procedures.

Criteria 24.5A.3.3

Test results are reported in accordance with enterprise standards and/or procedures.

Assessor guide: observe that –

Test results are reported according to standard

Assessor guide: confirm that –

Methods/procedures for reporting test results are explained.

Range statement

This unit describes the underpinning knowledge and skills required for the preparation of, and eddy current testing on, fabrications, structures and components across a wide range of industries. It includes wheel bead seat, production line, tube production line and conductivity measurement methods. The work can relate to scheduled and un-scheduled maintenance activities, using general tools, specific eddy current testing equipment as specified in maintenance documentation, testing procedures or operators instructions. Actual and potential defects be considered, together with ongoing abnormalities in fabrications, components and structures. Eddy current testing is performed on critical component or structural zones, and may require re-assessment of competency at regular intervals in accordance with relevant standards. All testing must be completed with particular attention to personal safety and OH&S regulations. Certification against Australian Standards may be achieved where assessment in this unit of competency is carried out in conjunction with an examining authority as described in ISO 9712. Materials and chemicals, which are subject to codes and regulations, for example, chemicals, explosives, solvents, dangerous materials, acids, or noxious waste products safe work habits must be stored and used in accordance with safe work practices. This unit should not be selected when Unit 24.6A Perform eddy current testing or Unit 15.4A Perform inspection basic has already been selected. Where power tools are required, Unit 18.2A Use power tools/hand held operations should also be selected.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or through a combination of both on and off the job. An individual working alone or as part of a team would demonstrate the competencies covered in this unit. The assessment environment should not disadvantage the candidate.

Assessment conditions

The candidate will be provided with:-

- all tools, equipment, materials and documentation required.

The candidate will be permitted access to the following documents: -

- any relevant workplace procedures;
- any relevant product and manufacturing specifications;
- any relevant codes, standards, manuals and reference materials.

The candidate will be required to:

- orally, or by other methods of communication, answer questions put by the assessor about processes, events or tasks being undertaken;
- identify colleagues who can be approached for the collection of competency evidence, where appropriate;
- present evidence of any off-job training related to this unit
- perform the tasks within the time frames established between the candidates supervisor/instructor and the assessor, prior to the assessment;

Assessors must be satisfied that the candidate can competently and consistently perform all elements of this unit as specified by the criteria, including required knowledge.

Activities should closely simulate a workplace environment and conditions due to the critical nature of this work.

Critical aspects

The candidate should demonstrate sufficient underpinning knowledge of:

- OH&S requirements
- metallurgy associated with the level of application in this unit
- take responsibility for the quality of their own work;

This unit could be assessed in conjunction with other units addressing the safety, quality, communication, materials handling, recording and reporting associated with non-destructive testing in accordance with relevant standards and procedures, or other units requiring the exercise of skills and knowledge covered in this unit.

Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Special notes

During assessment the individual will:

- demonstrate safe working practices at all times;
- communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment;

- plan tasks in all situations and review task requirements as appropriate;
- perform all tasks to specifications and use accepted NDT techniques, practices, processes and workplace procedures;
- tasks will be completed within reasonable time frames relating to typical workplace activities.

Unit MEM 24.6A A Perform eddy current testing

Band – Specialisation band A

Field – Non-destructive testing

Unit Weight 6

Notes - This unit has dual status and is to be regarded as both a Specialisation band A unit and Specialisation band B unit for progression to C5 (AQF level V)

Pre-requisite units - Path 1

18.1A Use hand tools

24.12A Apply metallurgy principles

Element 24.6A.1 Prepare inspection areas for eddy current testing

Criteria 24.6A.1.1

Inspection areas are identified, cleaned and prepared for testing using appropriate procedures and materials.

Assessor guide: observe that –

Inspection areas are identified by established techniques.

Assessor guide: confirm that –

Cleaning and preparation processes are explained for a range of test surfaces.

Appropriate cleaning materials are selected & applied.

Criteria 24.6A.1.2

Preparation processes are carried out in accordance with the relevant procedures, statutory and OH&S requirements.

Assessor guide: observe that –

Procedures are carried out correctly. Statutory and OH&S requirements are followed.

Assessor guide: confirm that –

Statutory and OH&S requirements can be explained in relation to the preparation process.

Criteria 24.6A.1.3

Inspection areas are visually assessed and obvious discontinuities identified.

Assessor guide: observe that –

Discontinuities are identified and classified from a visual inspection. A primary metallurgical assessment of inspection areas is used to describe primary or manufacturing or service defects.

Assessor guide: confirm that –

Established assessment procedures and techniques are explained. Types of discontinuities are explained and their consequences/effect on the material are described.

Element 24.6A.2 Perform eddy current testing

Criteria 24.6A.2.1

The most appropriate eddy current test for the material/application is selected.

Assessor guide: observe that –

Nominated testing method is appropriate regarding:

Defect type and orientation

- * part geometry and configuration
- * test frequency
- * probe configuration

Assessor guide: confirm that –

The eddy current testing technique is appropriate for the given situation. The procedure for carrying out each eddy current test can be explained.

Criteria 24.6A.2.2

Test equipment is selected and prepared in accordance with standards and/or procedures.

Assessor guide: observe that –

Test equipment is set up correctly. OH & S precautions are adhered to.

Assessor guide: confirm that –

The tools, equipment, techniques and system verification checks necessary to carry out the eddy current test can be identified.

Criteria 24.6A.2.3

Eddy current test is carried out in accordance with relevant standards, specifications and OH&S requirements.

Assessor guide: observe that –

Principles of electricity, magnetism and electromagnetism in relation to eddy current testing are applied. The test is performed correctly and in logical sequence OH&S requirements are followed at all times.

Assessor guide: confirm that –

Principles of electricity, magnetism, electromagnetism in relation to eddy current testing can be explained. Principles and applications of eddy current testing can be explained. Hazards associated with eddy current testing are identified and appropriate safety requirements outlined.

Criteria 24.6A.2.4

Eddy current test equipment is checked for defects, maintained and stored in accordance with procedures, OH&S requirements and manufacturer instructions.

Assessor guide: observe that –

Appropriate maintenance is carried out on test equipment and equipment is stored correctly. Faulty/unserviceable test equipment is identified.

Assessor guide: confirm that –

Maintenance and storage procedures for test equipment are explained. Common faults and damage can be outlined.

Element 24.6A.3 Interpret and report the results of eddy current tests**Criteria 24.6A.3.1**

Indications are assessed and defects detected and classified in accordance with national and international codes and standards.

Assessor guide: observe that –

Resultant signals and data is analysed and all relevant defects are detected. Defects are interpreted and classified in terms of national and international codes and standards.

Assessor guide: confirm that –

A range of indications/defects can be outlined. The meaning and application of national and international codes and standards is explained.

Criteria 24.6A.3.2

Defects are confirmed in accordance with enterprise procedures and industry practices.

Assessor guide: observe that –

Defect indications are confirmed. Test results are confirmed by other eddy current testing methods and/or other NDT methods.

Assessor guide: confirm that –

Confirmation of test results is explained.

Criteria 24.6A.3.3

Test results are reported in accordance with enterprise procedures, accepted industry practices and customer service requirements.

Assessor guide: observe that –

Report is completed correctly and according to procedures. Test results, implications and related information are conveyed to end user.

Assessor guide: confirm that –

Methods/procedures for reporting test results are explained. Implications of test results for the particular material/application are explained.

Range statement

This unit describes the underpinning knowledge and skills required to inspect, interpret, classify and report results of eddy current testing on fabrications, structures and components across a wide range of industries to Level 2 (AS 3669 and AS 3998) or equivalent. This unit also includes identifying abnormalities such as corrosion, metal fatigue, deformation in non ferrous/ ferrous alloys, steels, fatigue cracks, stress corrosion cracking, heat damage, metal properties sorting, manufacturing defects, coating thickness measurement etc. The work can relate to scheduled and un-scheduled maintenance activities, using general tools, specific testing eddy current testing tools and equipment as specified in maintenance documentation, testing procedures or operators instructions.

Actual and potential defects are considered, together with ongoing abnormalities in fabrications, components, structures and/or aircraft components. Eddy current tests are performed on critical component or structural zones, and may require re-assessment of competency at regular intervals in accordance with Australian Standards and/or other relevant standards. All testing must be completed with particular attention to personal safety and OH&S regulations. Certification against Australian Standards may be achieved where assessment in this unit of competency is carried out in conjunction with an examining authority as described in ISO 9712. Materials and chemicals, which are subject to codes and regulations, for example, chemicals, explosives, solvents, dangerous materials, acids, or noxious waste products safe work habits must be stored and used in accordance with safe work practices.

This unit should not be selected when Unit 15.4A Perform inspection (basic) or Unit 15.5A Perform inspection (advanced) has already been selected. Where power tools are required, Unit 18.2A Use power tools/hand held operations should also be selected.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or through a combination of both on and off the job. An individual working alone or as part of a team would demonstrate the competencies covered in this unit. The assessment environment should not disadvantage the candidate.

Assessment conditions

The candidate will be provided with:-

- all tools, equipment, materials and documentation required.

The candidate will be permitted access to the following documents: -

- any relevant workplace procedures;
- any relevant product and manufacturing specifications;
- any relevant codes, standards, manuals and reference materials.

The candidate will be required to:

- orally, or by other methods of communication, answer questions put by the assessor about processes, events or tasks being undertaken;
- identify colleagues who can be approached for the collection of competency evidence, where appropriate;
- present evidence of any off-job training related to this unit
- perform the tasks within the time frames established between the candidates supervisor/instructor and the assessor, prior to the assessment;

Assessors must be satisfied that the candidate can competently and consistently perform all elements of this unit as specified by the criteria, including required knowledge.

Activities should closely simulate a workplace environment and conditions due to the critical

Critical aspects

The candidate should demonstrate sufficient underpinning knowledge of:

- OH&S requirements
- metallurgy associated with the level of application in this unit
- take responsibility for the quality of their own work;

This unit could be assessed in conjunction with other units addressing the safety, quality, communication, materials handling, recording and reporting associated with non-destructive testing in accordance with relevant standards and procedures, or other units requiring the exercise of skills and knowledge covered in this unit.

Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Special notes

During assessment the individual will:

- demonstrate safe working practices at all times;
- communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment;
- plan tasks in all situations and review task requirements as appropriate;
- perform all tasks to specifications and use accepted NDT techniques, practices, processes and workplace procedures;
- tasks will be completed within reasonable time frames relating to typical workplace activities.

nature of this work.

Unit MEM 24.7A A Perform ultrasonic thickness testing

Band – Specialisation band A

Field – Non-destructive testing

Unit Weight 2

Pre-requisite units - Path 1

18.1A Use hand tools

Element 24.7A.1 Prepare inspection areas for ultrasonic thickness testing

Criteria 24.7A.1.1

Inspection areas are cleaned and prepared for testing using appropriate procedures and materials.

Assessor guide: observe that –

Inspection areas are identified by established techniques.

Assessor guide: confirm that –

Cleaning and preparation processes can be explained for a variety of test surfaces.

Inspection areas are correctly prepared using the appropriate cleaning materials.

Criteria 24.7A.1.2

Preparation processes are carried out in accordance with the relevant procedures and OH&S requirements.

Assessor guide: observe that –

Preparation procedures are carried out correctly. OH&S requirements are followed at all times.

Assessor guide: confirm that –

Procedures and OH&S requirements can be explained in relation to the preparation process.

Criteria 24.7A.1.3

Inspection areas are visually assessed for obvious discontinuities.

Assessor guide: observe that –

All obvious discontinuities have been identified from a visual inspection.

Assessor guide: confirm that –

Established assessment procedures and techniques are explained.
Types of discontinuities are explained and their consequences outlined.

Element 24.7A.2 Perform ultrasonic thickness testing

Criteria 24.7A.2.1

Nominated ultrasonic thickness test is identified from standard operating procedures.

Assessor guide: observe that –

Procedures are interpreted correctly and all relevant information identified.

Assessor guide: confirm that –

The procedures for carrying out ultrasonic thickness test can be explained.

Criteria 24.7A.2.2

Test equipment is prepared in accordance with standard operating procedures.

Assessor guide: observe that –

Test equipment is prepared correctly. The procedures for setting up test equipment are demonstrated.

Assessor guide: confirm that –

The tools, equipment, techniques and system verification checks necessary to carry out the ultrasonic thickness test are explained.

Criteria 24.7A.2.3

Ultrasonic tests are carried out in accordance with relevant standards and OH&S requirements.

Assessor guide: observe that –

Basic principles of ultrasonic thickness testing are applied.

The test is performed correctly and in logical sequence. OH&S requirements are followed at all times.

Assessor guide: confirm that –

The advantages and limitations of ultrasonic thickness testing are explained. The hazards associated with ultrasonic thickness testing are identified and safety requirements outlined.

Criteria 24.7A.2.4

Ultrasonic test equipment is maintained and stored in accordance with standard operating procedures and OH &S requirements.

Assessor guide: observe that –

Basic maintenance is carried out on test equipment and equipment is stored correctly. OH&S requirements are followed at all times.

Assessor guide: confirm that –

Basic maintenance and storage procedures for testing equipment are explained. OH &S requirements can be explained.

Element 24.7A.3 Report the results of ultrasonic thickness tests**Criteria 24.7A.3.1**

Basic thicknesses are identified and explained in accordance with enterprise standards and/or procedures.

Assessor guide: observe that –

Procedure for identifying basic defects is followed.

Assessor guide: confirm that –

Common basic defects are explained. All indications can be explained and thickness confirmed.

Criteria 24.7A.3.2

Basic thicknesses are confirmed in accordance with enterprise standards and/or procedures.

Assessor guide: observe that –

Thickness indications are confirmed by other ultrasonic testing or NDT methods (if applicable).

Assessor guide: confirm that –

Confirmation of test results is explained in accordance with enterprise standards and/or procedures.

Criteria 24.7A.3.3

Test results are reported in accordance with enterprise standards and/or procedures.

Assessor guide: observe that –

Test results are reported according to standard

Assessor guide: confirm that –

Methods/procedures for reporting test results are explained.

Range statement

This unit describes the underpinning knowledge and skills required in applying, inspecting, interpreting and reporting on ultrasonic testing techniques of fabrications, structures and components. Testing across a wide range of industries which includes identifying abnormalities such as thickness measurement of corrosion, laminations of non-ferrous/ferrous alloys steels, composite materials.

The work can relate to scheduled and un-scheduled maintenance activities, using general tools, specific ultrasonic testing equipment as specified in maintenance documentation, testing procedures or operators instructions.

Actual and potential defects be considered, together with ongoing abnormalities in fabrications, components and structures on a wide range of applications. Ultrasonic tests are performed on critical component or structural zones, and may require re-assessment of competency at regular intervals in accordance with Australian Standards and/or other relevant standards. All testing must be completed with particular attention to personal safety and OH&S regulations.. Certification against Australian Standards may be achieved where assessment in this unit of competency is carried out in conjunction with an examining authority as described in ISO 9712. Materials and chemicals, which are subject to codes and regulations, for example, chemicals, explosives, solvents, dangerous materials, acids, or noxious waste products safe work habits must be stored and used in accordance with safe work practices.

This unit should not be selected when Unit 24.8A Perform ultrasonic testing or Unit 15.4A Perform inspection basic has already been selected. Where power tools are required, Unit 18.2A Use power tools/hand held operations should also be selected.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or through a combination of both on and off the job. An individual working alone or as part of a team would demonstrate the competencies covered in this unit. The assessment environment should not disadvantage the candidate.

Assessment conditions

The candidate will be provided with:-

- all tools, equipment, materials and documentation required.

The candidate will be permitted access to the following documents: -

- any relevant workplace procedures;
- any relevant product and manufacturing specifications;
- any relevant codes, standards, manuals and reference materials.

The candidate will be required to:

- orally, or by other methods of communication, answer questions put by the assessor about processes, events or tasks being undertaken;
- identify colleagues who can be approached for the collection of competency evidence, where appropriate;
- present evidence of any off-job training related to this unit
- perform the tasks within the time frames established between the candidates supervisor/instructor and the assessor, prior to the assessment;

Assessors must be satisfied that the candidate can competently and consistently perform all elements of this unit as specified by the criteria, including required knowledge.

Activities should closely simulate a workplace environment and conditions due to the critical nature of this work.

Critical aspects

The candidate should demonstrate sufficient underpinning knowledge of:

- OH&S requirements
- metallurgy associated with the level of application in this unit
- take responsibility for the quality of their own work;

This unit could be assessed in conjunction with other units addressing the safety, quality, communication, materials handling, recording and reporting associated with non-destructive testing in accordance with relevant standards and procedures, or other units requiring the exercise of skills and knowledge covered in this unit.

Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Special notes

During assessment the individual will:

- demonstrate safe working practices at all times;
- communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment;
- plan tasks in all situations and review task requirements as appropriate;
- perform all tasks to specifications and use accepted NDT techniques, practices, processes and workplace procedures;
- tasks will be completed within reasonable time frames relating to typical workplace activities.

Unit MEM 24.8A A Perform ultrasonic testing

Band – Specialisation band A

Field – Non-destructive testing

Unit Weight 6

Notes - This unit has dual status and is to be regarded as both a Specialisation band A unit and Specialisation band B unit for progression to C5 (AQF level V)

Pre-requisite units - Path 1

18.1A Use hand tools

24.12A Apply metallurgy principles

Element 24.8A.1 Prepare inspection areas for ultrasonic testing

Criteria 24.8A.1.1

Inspection areas are identified, cleaned and prepared for testing using appropriate procedures and materials.

Assessor guide: observe that –

Inspection areas are identified by established techniques.

Assessor guide: confirm that –

Cleaning and preparation processes can be explained for a variety of test surfaces.

Appropriate cleaning materials are selected & applied.

Criteria 24.8A.1.2

Preparation processes are carried out in accordance with the relevant procedures, statutory and OH&S requirements.

Assessor guide: observe that –

Procedures are carried out correctly. Statutory and OH&S requirements are followed.

Assessor guide: confirm that –

Procedure, statutory and OH&S requirements can be explained in relation to the preparation process.

Criteria 24.8A.1.3

Inspection areas are visually assessed and obvious discontinuities identified.

Assessor guide: observe that –

Discontinuities are identified, classified and confirmed from a visual inspection. A primary metallurgical assessment of inspection areas is used to describe primary or manufacturing or service defects.

Assessor guide: confirm that –

Established assessment procedures and techniques are explained. Types of discontinuities are explained and their consequences/effect on the material are described.

Element 24.8A.2 Perform ultrasonic testing

Criteria 24.8A.2.1

The most appropriate ultrasonic test for the material/application is selected.

Assessor guide: observe that –

Nominated testing method is appropriate regarding:

- material type and form
- defect type
- standards and/or procedures

Assessor guide: confirm that –

The ultrasonic testing technique is appropriate for the given situation. Selection of testing method can be justified/explained. The procedure for carrying out ultrasonic test can be explained.

Criteria 24.8A.2.2

Testing equipment is selected and prepared in accordance with standards and/or procedures.

Assessor guide: observe that –

Test equipment is set up correctly OH & S precautions are adhered to.

Assessor guide: confirm that –

The tools, equipment, techniques and system verification checks necessary to carry out the ultrasonic tests can be identified.

Criteria 24.8A.2.3

Ultrasonic test is carried out in accordance with relevant standards, specifications and OH&S requirements.

Assessor guide: observe that –

Principles of ultrasonic testing are applied. The ultrasonic test is performed correctly and in logical sequence OH&S requirements are followed at all times.

Assessor guide: confirm that –

Principles of ultrasonic testing are explained. Relevant standards are explained. The hazards associated with ultrasonic testing are identified and appropriate safety requirements outlined.

Criteria 24.8A.2.4

Ultrasonic testing equipment is checked for defects, maintained and stored in accordance with procedures, OH&S requirements and manufacturer instructions.

Assessor guide: observe that –

Appropriate maintenance is carried out on test equipment and equipment is stored correctly. Faulty/unserviceable test equipment is identified.

Assessor guide: confirm that –

Maintenance and storage procedures for testing equipment are explained. Common faults and damage can be outlined.

Element 24.8A.3 Interpret and report the results of ultrasonic tests**Criteria 24.8A.3.1**

Indications are assessed and defects detected and classified in accordance with national and international codes and standards.

Assessor guide: observe that –

Resultant signals and data are analysed. All relevant defects are detected. Defects are interpreted and classified in terms of national and international codes and standards.

Assessor guide: confirm that –

A range of defects are explained. The meaning and application of national and international codes and standards is explained.

Criteria 24.8A.3.2

Defects are confirmed in accordance with enterprise procedures and industry practices.

Assessor guide: observe that –

Defect indications are confirmed. Test results are confirmed by other ultrasonic testing methods and/or other NDT methods.

Assessor guide: confirm that –

Confirmation of test results is explained.

Criteria 24.8A.3.3

Test results are reported in accordance with enterprise procedures, accepted industry practices and customer service requirements.

Assessor guide: observe that –

Report is completed correctly and according to procedures. Test results, implications of results and related information are conveyed to end user.

Assessor guide: confirm that –

Methods/procedures for reporting test results are explained. Implications of test results for the particular material/application are explained.

Range statement

This unit describes the underpinning knowledge and skills required in applying, inspecting, interpreting, classifying and reporting on ultrasonic testing techniques of fabrications, structures and components. Testing across a wide range of industries to Level 2 (AS 3669 and AS 3998) or equivalent and includes identifying abnormalities such as corrosion, metal fatigue, deformation in non ferrous/ferrous alloys steels, composite materials, fatigue cracks, stress corrosion cracking, manufacturing defects, thickness measurement and fit, mechanical and bonded repairs, laminar tearing, welding defects and casting defects and/or aircraft components.

The work can relate to scheduled and un-scheduled maintenance activities, using general tools, specific ultrasonic testing equipment as specified in maintenance documentation, testing procedures or operators instructions.

Actual and potential defects be considered, together with ongoing abnormalities in fabrications, components and structures on a wide range of applications. Ultrasonic tests are performed on critical component or structural zones, and may require re-assessment of competency at regular intervals in accordance with Australian Standards and/or other relevant standards. All testing must be completed with particular attention to personal safety and OH&S regulations. Certification against Australian Standards may be achieved where assessment in this unit of competency is carried out in conjunction with an examining authority as described in ISO 9712. Materials and chemicals, which are subject to codes and regulations, for example, chemicals, explosives, solvents, dangerous materials, acids, or noxious waste products safe work habits must be stored and used in accordance with safe work practices.

This unit should not be selected when Unit 15.4A Perform inspection (basic) or Unit 15.5A Perform inspection (advanced) has already been selected. Where power tools are required, Unit 18.2A Use power tools/hand held operations should also be selected.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or through a combination of both on and off the job. An individual working alone or as part of a team would demonstrate the competencies covered in this unit. The assessment environment should not disadvantage the candidate.

Assessment conditions

The candidate will be provided with:-

- all tools, equipment, materials and documentation required.

The candidate will be permitted access to the following documents: -

- any relevant workplace procedures;
- any relevant product and manufacturing specifications;
- any relevant codes, standards, manuals and reference materials.

The candidate will be required to:

- orally, or by other methods of communication, answer questions put by the assessor about processes, events or tasks being undertaken;
- identify colleagues who can be approached for the collection of competency evidence, where appropriate;
- present evidence of any off-job training related to this unit
- perform the tasks within the time frames established between the candidates supervisor/instructor and the assessor, prior to the assessment;

Assessors must be satisfied that the candidate can competently and consistently perform all elements of this unit as specified by the criteria, including required

knowledge.

Activities should closely simulate a workplace environment and conditions due to the critical

Critical aspects

The candidate should demonstrate sufficient underpinning knowledge of:

- OH&S requirements
- metallurgy associated with the level of application in this unit
- take responsibility for the quality of their own work;

This unit could be assessed in conjunction with other units addressing the safety, quality, communication, materials handling, recording and reporting associated with non-destructive testing in accordance with relevant standards and procedures, or other units requiring the exercise of skills and knowledge covered in this unit.

Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Special notes

During assessment the individual will:

- demonstrate safe working practices at all times;
- communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment;
- plan tasks in all situations and review task requirements as appropriate;
- perform all tasks to specifications and use accepted NDT techniques, practices, processes and workplace procedures;
- tasks will be completed within reasonable time frames relating to typical workplace activities.

Unit MEM 24.9A A Perform basic radiographic testing

Band – Specialisation band A

Field – Non-destructive testing

Unit Weight 2

Pre-requisite units - Path 1

13.13A Work safely with ionizing radiation

18.1A Use hand tools

Element 24.9A.1 Prepare inspection areas ready for basic radiographic testing

Criteria 24.9A.1.1

Radiographic specimens are cleaned and prepared for testing using appropriate procedures and materials.

Assessor guide: observe that –

Inspection areas are identified by established techniques. Inspection areas are correctly prepared using the appropriate cleaning materials. Specimens are set up according to the nominated techniques and methods.

Assessor guide: confirm that –

Cleaning and preparation processes are explained.

Criteria 24.9A.1.2

Preparation processes are carried out in accordance with the relevant procedures and OH&S requirements.

Assessor guide: observe that –

Preparation procedures are carried out correctly. OH&S requirements are followed at all times.

Assessor guide: confirm that –

Procedures and OH&S requirements can be explained in relation to the preparation process.

Criteria 24.9A.1.3

Inspection areas are visually assessed and obvious discontinuities identified.

Assessor guide: observe that –

All obvious discontinuities have been identified from a visual inspection.

Assessor guide: confirm that –

Established inspection procedures and techniques are explained. Types of discontinuities are explained and their consequences outlined.

Element 24.9A.2 Set up radiographic test equipment

Criteria 24.9A.2.1

Nominated test is identified from standard operating procedures.

Assessor guide: observe that –

Procedures are interpreted correctly and all relevant information identified.

Assessor guide: confirm that –

The procedure for carrying out radiographic test can be explained.

Criteria 24.9A.2.2

Radiation testing and processing equipment is set up in accordance with standard operating procedures.

Assessor guide: observe that –

Test equipment is prepared correctly. The procedures for setting up test equipment are demonstrated.

Assessor guide: confirm that –

Principal components of x-ray and gamma ray equipment can be identified. The tools, equipment, techniques and system verification checks necessary to carry out the radiographic tests can be identified.

Element 24.9A.3 Carry out basic radiographic tests**Criteria 24.9A.3.1**

Basic properties of x-rays and gamma rays are identified.

Assessor guide: observe that –

Intensities of ionising radiation are calculated in imperial and metric systems.

Assessor guide: confirm that –

Characteristics and sources of ionising radiation are explained. Different units of radiation are explained.

Criteria 24.9A.3.2

Safety practices and controls for minimising radiation exposure are applied.

Assessor guide: observe that –

Minimum exposure rates/distances are calculated. Relevant codes and regulations are observed. Emergency procedures are followed.

Assessor guide: confirm that –

Interaction of ionising radiation and matter is explained. Processes by which ionising radiation is detected can be outlined. Hazards associated with ionising radiation are explained and regulatory exposure limits outlined. Exposure reduction factors are explained: time, distance, shielding.

Criteria 24.9A.3.3

Radiographic testing and safety equipment is operated in accordance with relevant work instructions and OH&S requirements.

Assessor guide: observe that –

Basic principles of radiographic testing are applied. Radiographic tests are performed correctly and in logical sequence. OH&S requirements are followed at all times.

Assessor guide: confirm that –

The tools, equipment, techniques and system verification checks necessary to carry out the test are explained.

Criteria 24.9A.3.4

Films are processed to achieve optimum results.

Assessor guide: observe that –

safe work practices are applied in handling of radiographic films and chemicals.

Assessor guide: confirm that –

Film processing techniques, materials and development conditions are outlined.

Range statement

This unit describes the underpinning knowledge and skills required to work with ionizing radiation in open or closed sites; on fabrications, structures and components across a wide range of industries. The work can relate to scheduled and un-scheduled maintenance activities, using general tools, specific radiographic testing equipment as specified in maintenance documentation, testing procedures or operators instructions.

All testing must be completed with particular attention to personal and OH&S regulations. Ionizing radiation equipment materials and chemicals, which are subject to codes and regulations, are stored, used, and transported must be stored and used in accordance with safe work practices. Certification against Australian Standards may be achieved where assessment in this unit of competency is carried out in conjunction with an examining authority as described in ISO 9712.

This unit should not be selected when Unit 24.10A Perform radiographic testing or Unit 15.4A Perform inspection basic has already been selected/has been also selected Where power tools are required, Unit 18.2A Use power tools/hand held operations should also be selected.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or through a combination of both on and off the job. An individual working alone or as part of a team would demonstrate the competencies covered in this unit. The assessment environment should not disadvantage the candidate.

Assessment conditions

The candidate will be provided with:-

- all tools, equipment, materials and documentation required.

The candidate will be permitted access to the following documents: -

- any relevant workplace procedures;
- any relevant product and manufacturing specifications;
- any relevant codes, standards, manuals and reference materials.

The candidate will be required to:

- orally, or by other methods of communication, answer questions put by the assessor about processes, events or tasks being undertaken;
- identify colleagues who can be approached for the collection of competency evidence, where appropriate;
- present evidence of any off-job training related to this unit
- perform the tasks within the time frames established between the candidates supervisor/instructor and the assessor, prior to the assessment;

Assessors must be satisfied that the candidate can competently and consistently perform all elements of this unit as specified by the criteria, including required knowledge.

Activities should closely simulate a workplace environment and conditions due to the critical nature of this work.

Critical aspects

The candidate should demonstrate sufficient underpinning knowledge of:

- OH&S requirements
- metallurgy associated with the level of application in this unit
- take responsibility for the quality of their own work;

This unit could be assessed in conjunction with other units addressing the safety, quality, communication, materials handling, recording and reporting associated with non-destructive testing in accordance with relevant standards and procedures, or other units requiring the exercise of skills and knowledge covered in this unit.

Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Special notes

During assessment the individual will:

- demonstrate safe working practices at all times;
- communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment;
- plan tasks in all situations and review task requirements as appropriate;
- perform all tasks to specifications and use accepted NDT techniques, practices, processes and workplace procedures;
- tasks will be completed within reasonable time frames relating to typical workplace activities.

Unit MEM 24.10A A Perform radiographic testing

Band – Specialisation band A

Field – Non-destructive testing

Unit Weight 6

Notes - This unit has dual status and is to be regarded as both a Specialisation band A unit and Specialisation band B unit for progression to C5 (AQF level V)

Pre-requisite units - Path 1

13.13A Work safely with ionizing radiation

18.1A Use hand tools

24.12A Apply metallurgy principles

Element 24.10A.1 Prepare inspection areas for radiographic testing

Criteria 24.10A.1.1

Inspection areas are identified, cleaned and prepared for testing using appropriate procedures and materials.

Assessor guide: observe that –

Inspection areas are identified by established techniques. Appropriate cleaning materials are selected & applied.

Assessor guide: confirm that –

Cleaning and preparation processes are explained for a range of test surfaces.

Criteria 24.10A.1.2

Preparation processes are carried out in accordance with the relevant procedures, statutory and OH&S requirements.

Assessor guide: observe that –

Procedures are carried out correctly. Statutory and OH&S requirements are followed.

Assessor guide: confirm that –

Procedure, statutory and OH&S requirements can be explained in relation to the preparation process.

Criteria 24.10A.1.3

Inspection areas are visually assessed and obvious discontinuities identified.

Assessor guide: observe that –

Discontinuities are identified, classified and confirmed from a visual inspection. A primary metallurgical assessment of inspection areas is used to describe primary or manufacturing or service defects.

Assessor guide: confirm that –

Established assessment procedures and techniques are explained. Types of discontinuities are explained and their consequences/effect on the material are described.

Element 24.10A.2 Select and prepare radiographic test**Criteria 24.10A.2.1**

The most appropriate radiographic test for the material/application is selected.

Assessor guide: observe that –
Nominated testing method is appropriate regarding radiography sensitivity:
- contrast
- definition

Assessor guide: confirm that –
Appropriateness of testing method can be justified/explained. The procedure for carrying out each radiographic test can be explained.
Principal types of x-ray generators and radioisotopes can be identified and their effect on radiographic sensitivity outlined.

Criteria 24.10A.2.2

Appropriate testing and processing equipment is selected and set up for various geometries in accordance with standards and/or procedures.

Assessor guide: observe that –
Test equipment is set up correctly OH & S precautions are adhered to. Equipment settings are checked and verified.

Assessor guide: confirm that –
Tools, equipment, techniques and system verification checks necessary to carry out the radiographic tests can be identified and explained.

Criteria 24.10A.2.3

Quality of radiographic test is optimised.

Assessor guide: observe that –
The most suitable film/screen combinations and number of exposures are selected/calculated for the conditions. Principles for calculating and producing optimum quality radiographs are applied.

Assessor guide: confirm that –
Photographic features and aspects of radiographic film exposure & development are described.

Element 24.10A.3 Perform radiographic testing**Criteria 24.10A.3.1**

Radiographic tests are carried out in accordance with relevant standards, codes, specifications and OH&S requirements.

Assessor guide: observe that –
Relevant standards and OH&S requirements are applied at all times.

Assessor guide: confirm that –
Relevant standards, regulations and codes are explained. The hazards associated with radiographic testing are identified.

Criteria 24.10A.3.2

Radiographs are set up and carried out for specialised applications.

Assessor guide: observe that –
Specialised radiographic applications are identified and correct set up procedures are applied.

Assessor guide: confirm that –
Procedures for specialised radiographic applications are described.

Criteria 24.10A.3.3

Films are processed to maximise quality of image.

Assessor guide: observe that –

Processes for maximising image quality are applied.

Assessor guide: confirm that –

Principles of image formation, film and chemical properties and processing techniques are outlined.

Criteria 24.10A.3.4

Films are processed to achieve optimum results.

Assessor guide: observe that –

Safe work practices are applied in handling of radiographic films and chemicals.

Assessor guide: confirm that –

Various types of films and screens, their properties and effects on image quality can be identified and explained. Principles of image formation are explained. Film processing techniques, materials and development conditions. are outlined.

Element 24.10A.4 Maintain radiographic testing equipment**Criteria 24.10A.4.1**

Radiographic testing equipment is checked for defects, maintained and stored in accordance with procedures, OH&S requirements and manufacturer instructions.

Assessor guide: observe that –

Appropriate maintenance is carried out on test equipment and equipment is stored correctly including:

- ionizing apparatus
- processing equipment
- viewers

Assessor guide: confirm that –

Maintenance and storage procedures for test equipment are explained. Common faults and damage can be outlined.

Faulty / unserviceable test equipment is identified Testing equipment is properly maintained and returned to usual storage areas

Element 24.10A.5 Monitor and ensure radiation safety**Criteria 24.10A.5.1**

Safety controls are set up and maintained.

Assessor guide: observe that –

Safety requirements are applied at all times. Criteria for the effective design of exposure & storage areas are determined.

Assessor guide: confirm that –

Applicable regulations and codes of practice are outlined. Safety features of radioisotope cameras and x-ray equipment are explained.

Criteria 24.10A.5.2

Exposure to radiation employees and general public is minimised.

Assessor guide: observe that –

Equipment is selected & used to detect & measure ionising radiation. Shielding thicknesses are calculated using first principles, tables and charts.

Assessor guide: confirm that –

Production of x-rays and gamma rays is described. Factors that can be controlled to minimise exposure are outlined. Absorption of ionising radiation by matter and the biological effects on living matter are explained.

Criteria 24.10A.5.3

Radiation monitoring equipment is selected & used.

Assessor guide: observe that –

Equipment is set up and used in accordance with relevant codes & practices.

Assessor guide: confirm that –

Types of equipment & their applications and limitations are outlined.

Element 24.10A.6 Interpret and report the results of radiographic tests**Criteria 24.10A.6.1**

Conditions necessary to view and interpret radiographs are established.

Assessor guide: observe that –

Appropriate radiographic viewing facilities are set up.

Assessor guide: confirm that –

Conditions necessary to view & interpret radiographs are explained.

Criteria 24.10A.6.2

Radiographs are interpreted/evaluated in accordance with applicable codes, standards and specifications.

Assessor guide: observe that –

Defects are interpreted and classified in terms of national and international codes and standards.

Assessor guide: confirm that –

Different indications/anomalies can be interpreted and classified in terms of international codes and standards.

Criteria 24.10A.6.3

Test results are reported in accordance with enterprise procedures, accepted industry practices and customer service requirements.

Assessor guide: observe that –

Report is completed correctly and according to procedures. Test results, implications and related information are conveyed to end user.

Assessor guide: confirm that –

Methods/procedures for reporting test results are explained. Implications of test results for the particular material/application are explained.

Range statement

This unit describes the underpinning knowledge and skills required in applying, inspecting, interpreting, classifying and reporting on radiographic testing techniques of fabrications, structures and components. Testing across a wide range of industries to Level 2 (AS 3669 and AS 3998) or equivalent and includes identifying abnormalities such as corrosion, metal fatigue, deformation in non ferrous/ferrous alloys steels, composite materials, fatigue cracks, stress corrosion cracking, manufacturing defects, thickness measurement and fit, mechanical and bonded repairs, welding defects and casting defects and/or aircraft components.

The work can relate to scheduled and un-scheduled maintenance activities, using general tools, specific radiographic testing equipment as specified in maintenance documentation, testing procedures or operators instructions.

Actual and potential defects be considered, together with ongoing abnormalities in fabrications, components and structures on a wide range of applications. Radiographic tests are performed on critical component or structural zones, and may require re-assessment of competency at regular intervals in accordance with Australian Standards and/or other relevant standards. All testing must be completed with particular attention to personal and OH&S regulations. Ionizing radiation equipment materials and chemicals, which are subject to codes and regulations, are stored, used, and transported must be stored and used in accordance with safe work practices. Certification against Australian Standards may be achieved where assessment in this unit of competency is carried out in conjunction with an examining authority as described in ISO 9712.

This unit should not be selected when Unit 15.4A Perform inspection (basic) or Unit 15.5A Perform inspection (advanced) has already been selected. Where power tools are required, Unit 18.2A Use power tools/hand held operations should also be selected.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or through a combination of both on and off the job. An individual working alone or as part of a team would demonstrate the competencies covered in this unit. The assessment environment should not disadvantage the candidate.

critical

Assessment conditions

The candidate will be provided with:-

- all tools, equipment, materials and documentation required.

The candidate will be permitted access to the following documents: -

- any relevant workplace procedures;
- any relevant product and manufacturing specifications;
- any relevant codes, standards, manuals and reference materials.

The candidate will be required to:

- orally, or by other methods of communication, answer questions put by the assessor about processes, events or tasks being undertaken;
- identify colleagues who can be approached for the collection of competency evidence, where appropriate;
- present evidence of any off-job training related to this unit
- perform the tasks within the time frames established between the candidates supervisor/instructor and the assessor, prior to the assessment;

Assessors must be satisfied that the candidate can competently and consistently perform all elements of this unit as specified by the criteria, including required knowledge. Activities should closely simulate a workplace environment and conditions due to the nature of this work.

Critical aspects

The candidate should demonstrate sufficient underpinning knowledge of:

- OH&S requirements
- metallurgy associated with the level of application in this unit
- take responsibility for the quality of their own work;

This unit could be assessed in conjunction with other units addressing the safety, quality, communication, materials handling, recording and reporting associated with non-destructive testing in accordance with relevant standards and procedures, or other units requiring the exercise of skills and knowledge covered in this unit.

Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Special notes

During assessment the individual will:

- demonstrate safe working practices at all times;
- communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment;
- plan tasks in all situations and review task requirements as appropriate;
- perform all tasks to specifications and use accepted NDT techniques, practices, processes and workplace procedures;
- tasks will be completed within reasonable time frames relating to typical workplace activities.

Unit MEM 24.11B A Establish non-destructive tests

Band – Specialisation band B

Field – Non-destructive testing

Unit Weight 12

Pre-requisite units - Path 1

2.10C5 Write reports

24.2A Perform penetrant testing

24.8A Perform ultrasonic testing

13.13A Work safely with ionizing radiation

24.4A Perform magnetic particle testing

24.10A Perform radiographic testing

18.1A Use hand tools

24.6A Perform eddy current testing

24.12A Apply metallurgy principles

Element 24.11B.1 Assess requirements for non destructive test

Criteria 24.11B.1.1

Inspection area is assessed for testing and all possible failure sites identified utilising metallurgical analysis.

Assessor guide: observe that –

All possible failure sites have been identified. A metallurgical assessment of inspection areas is carried out to describe all manufacturing or service defects.

Assessor guide: confirm that –

Application of metallurgical analysis to assess inspection areas is explained.

Criteria 24.11B.1.2

Relevant information for test development is collected from available sources using accepted techniques.

Assessor guide: observe that –

Assessor guide: confirm that –

Criteria 24.11B.1.3

Information is analysed and interpreted.

Assessor guide: observe that –

Assessor guide: confirm that –

Criteria 24.11B.1.4

Test requirements are determined.

Assessor guide: observe that –

Assessor guide: confirm that –

Element 24.11B.2 Establish non destructive test techniques and procedures

Criteria 24.11B.2.1

Test methods, techniques and procedures to be used for specific NDT work are designated.

Assessor guide: observe that –

Most appropriate method, technique or procedure is designated.

Assessor guide: confirm that –

Particular methods, techniques and procedures can be outlined in relation to a range of NDT work.

Criteria 24.11B.2.2

Codes, standards, specifications and procedures are interpreted.

Assessor guide: observe that –

All relevant information is referenced.

Assessor guide: confirm that –

The meaning of all relevant codes, standards, specifications and procedures can be explained.

Criteria 24.11B.2.3

Test procedures are developed in accordance with established techniques and metallurgical principles.

Assessor guide: observe that –

Applicable test procedures are developed with regard to testing techniques and specimen.

Assessor guide: confirm that –

Test procedure can be explained with regard to testing techniques and specimen.

Element 24.11B.3 Validate/confirm non destructive tests**Criteria 24.11B.3.1**

General and specific test procedures are validated in accordance with established techniques.

Assessor guide: observe that –

Test procedures are validated and suitability of test determined.

Assessor guide: confirm that –

Validation processes are outlined.

Criteria 24.11B.3.2

Inspection results are interpreted and evaluated in terms of existing codes, standards and specifications.

Assessor guide: observe that –

Applicable specifications, codes and standards are utilised.

Assessor guide: confirm that –

The validity of the selection of specifications, codes and standards can be explained.

Element 24.11B.4 Approve non destructive test procedures**Criteria 24.11B.4.1**

Procedures are approved in accordance with workplace procedures and relevant codes and standards.

Assessor guide: observe that –

Approval procedure is followed.

Assessor guide: confirm that –

Process for approval of procedures is explained.

Criteria 24.11B.4.2

Procedures are documented and distributed in accordance with workplace requirements and relevant codes and standards.

Assessor guide: observe that –

Procedure format follows documentation protocols. Enterprise approval process is followed. Procedures are documented as per organisation's quality system requirements.

Assessor guide: confirm that –

Process for documentation and distribution of procedures is explained.

Element 24.11B.5 Evaluate non destructive test procedures**Criteria 24.11B.5.1**

Procedures are evaluated for effectiveness.

Assessor guide: observe that –

Assessor guide: confirm that –

Evaluation procedures can be explained.

Criteria 24.11B.5.2

Evaluation results are documented and reported according to workplace requirements.

Assessor guide: observe that –

Assessor guide: confirm that –

Process for documentation is explained.

Criteria 24.11B.5.3

Changes/amendments to non destructive test procedures are made and distributed as necessary.

Assessor guide: observe that –

Assessor guide: confirm that –

Process for amending test and distributing amendments is explained.

Range statement

Work undertaken autonomously using predetermined standards of quality, safety and workshop procedures. This unit applies to research, development, approval and evaluation of applicable non-destructive tests on fabrications, structures and components across a wide range of industries to Level 3 (AS 3669 and AS 3998) or equivalent. The work can relate to scheduled and un-scheduled maintenance activities, using general tools, specific testing equipment, test development procedures or guidelines. Activities should replicate 'in-service' - tasks due to the high level of self-supervision and critical nature of the work.

Actual and potential defects are considered, together with ongoing abnormalities in fabrications, components, structures from a wide range of applications by the selection of relevant testing method. Tests are validated/evaluated on critical component or structural zones. All testing must be developed and completed with particular attention to personal safety and OH&S regulations.. Certification against Australian Standards may be achieved where assessment in this unit of competency is carried out in conjunction with an examining authority as described in ISO 9712. Materials and chemicals, which are subject to codes and regulations, for example, chemicals, explosives, solvents, dangerous materials, acids, or noxious waste products safe work habits must be stored and used in accordance with safe work practices. This unit should not be selected when Unit 5.25B Perform welding fabrication inspection has already been selected.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or through a combination of both on and off the job. An individual working alone or as part of a team would demonstrate the competencies covered in this unit. The assessment environment should not disadvantage the candidate.

Assessment conditions

The candidate will be provided with:-

- all tools, equipment, materials and documentation required.

The candidate will be permitted access to the following documents: -

- any relevant workplace procedures;
- any relevant product and manufacturing specifications;
- any relevant codes, standards, manuals and reference materials.

The candidate will be required to:

- orally, or by other methods of communication, answer questions put by the assessor about processes, events or tasks being undertaken;
- identify colleagues who can be approached for the collection of competency evidence, where appropriate;
- present evidence of any off-job training related to this unit
- perform the tasks within the time frames established between the candidates supervisor/instructor and the assessor, prior to the assessment;

Assessors must be satisfied that the candidate can competently and consistently perform all elements of this unit as specified by the criteria, including required knowledge.

Activities should closely simulate a workplace environment and conditions due to the critical nature of this work.

Critical aspects

The candidate should demonstrate sufficient underpinning knowledge of:

- OH&S requirements
- metallurgy associated with the level of application in this unit
- take responsibility for the quality of their own work;

This unit could be assessed in conjunction with other units addressing the safety, quality, communication, materials handling, recording and reporting associated with non-destructive testing in accordance with relevant standards and procedures, or other units requiring the exercise of skills and knowledge covered in this unit.

Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Special notes

During assessment the individual will:

- demonstrate safe working practices at all times;
- communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment;
- plan tasks in all situations and review task requirements as appropriate;
- perform all tasks to specifications and use accepted NDT techniques, practices, processes and workplace procedures;
- tasks will be completed within reasonable time frames relating to typical workplace activities.

Unit MEM 24.12A A Apply metallurgy principles

Band – Specialisation band A

Field – Non-destructive testing

Unit Weight 4

Notes - This unit has dual status and is to be regarded as both a Specialisation band A unit and Specialisation band B unit for progression to C5 (AQF level V)

Element 24.12A.1 Interpret and apply the principles of solidification and crystal structures in metals

Criteria 24.12A.1.1

Principles of solidification and crystal structures in metals are interpreted and applied in relation to NDT techniques.

Assessor guide: observe that –

The principles of solidification and crystal structures is applied in various NDT testing situations.

Assessor guide: confirm that –

The principles of solidification and crystal structures in metal can be explained.

Element 24.12A.2 Interpret equilibrium diagrams for metals

Criteria 24.12A.2.1

Equilibrium diagrams are correctly interpreted.

Assessor guide: observe that –

Assessor guide: confirm that –

The meaning of equilibrium diagrams, representative of a range of metals including aluminium and steel, can be explained.

Element 24.12A.3 Interpret and apply the principles of fusion welding of steel

Criteria 24.12A.3.1

Principles and methods for fusion welding of steel are applied to NDT testing.

Assessor guide: observe that –

Assessor guide: confirm that –

The principles of fusion welding are understood and can be explained in relation to NDT testing. In particular, MMAW, SAW, GMAW, GTAW & FCAW.

Criteria 24.12A.3.2

Defects in weldments are identified and classified.

Assessor guide: observe that –

Assessor guide: confirm that –

Defects in fusion welding can be classified, including:

- cracks, lack of fusion
- cavities, imperfect shape
- solid inclusions, miscellaneous

Element 24.12A.4 Interpret and apply the principles of the formation of castings**Criteria 24.12A.4.1**

Principle methods used to produce metal castings are applied to NDT testing.

Assessor guide: observe that –

Assessor guide: confirm that –

The principles of the formation of castings are can be explained.

Criteria 24.12A.4.2

Defects in metal castings are identified and classified.

Assessor guide: observe that –

Assessor guide: confirm that –

Defects in castings can be classified including:

- shrinkage cavities
- hot tears
- cold cracks
- gas holes

Element 24.12A.5 Interpret and apply the principles of steel forging**Criteria 24.12A.5.1**

Principles methods used to produce steel forgings are applied to NDT testing.

Assessor guide: observe that –

Assessor guide: confirm that –

The principles of steel forging are can be explained. In particular:

- deformations
- strengthening mechanisms
- annealing

Criteria 24.12A.5.2

Defects in steel castings are identified and classified.

Assessor guide: observe that –

Assessor guide: confirm that –

Defects in steel forging can be identified and classified.

Element 24.12A.6 Interpret and apply the principles of mechanical testing**Criteria 24.12A.6.1**

Principles of mechanical testing are applied to NDT testing.

Assessor guide: observe that –

Assessor guide: confirm that –

The principles of mechanical testing can be explained. In particular, impact, tensile and hardness testing.

Range statement

This unit describes the underpinning knowledge of metallurgy. The relationship between the various non destructive testing methods and their capabilities and limitations, when applied for the detection of specific discontinuities in metals. Such variable as type of discontinuity, manufacturing process and limitations will assist in determining the sequence of testing and the ultimate selection of one non destructive test method in preference to another.

Any testing that may be carried out, must be completed with particular attention to personal and OH&S regulations. Where materials and chemicals, which are subject to codes and regulations, are stored and used, for example, chemicals, explosives, solvents, dangerous materials, acids, or noxious waste products, safe work habits must be considered.

Evidence guide

Assessment context

This unit may be assessed on the job, off the job or through a combination of both on and off the job. An individual working alone or as part of a team would demonstrate the competencies covered in this unit. The assessment environment should not disadvantage the candidate.

Assessment conditions

The candidate will be provided with:-

- all tools, equipment, materials and documentation required.

The candidate will be permitted access to the following documents: -

- any relevant workplace procedures;
- any relevant product and manufacturing specifications;
- any relevant codes, standards, manuals and reference materials.

The candidate will be required to:

- orally, or by other methods of communication, answer questions put by the assessor about processes, events or tasks being undertaken;
- identify colleagues who can be approached for the collection of competency evidence, where appropriate;
- present evidence of any off-job training related to this unit
- perform the tasks within the time frames established between the candidates supervisor/instructor and the assessor, prior to the assessment;

Assessors must be satisfied that the candidate can competently and consistently perform all elements of this unit as specified by the criteria, including required knowledge.

Activities should closely simulate a workplace environment and conditions due to the critical nature of this work.

Critical aspects

The candidate should demonstrate sufficient underpinning knowledge of:

- OH&S requirements
- metallurgy associated with the level of application in this unit
- take responsibility for the quality of their own work;

This unit could be assessed in conjunction with other units addressing the safety, quality, communication, materials handling, recording and reporting associated with non-destructive testing in accordance with relevant standards and procedures, or other units requiring the exercise of skills and knowledge covered in this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Special notes

During assessment the individual will:

- demonstrate safe working practices at all times;
- communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment;
- plan tasks in all situations and review task requirements as appropriate;
- perform all tasks to specifications and use accepted NDT techniques, practices, processes and workplace procedures;
- tasks will be completed within reasonable time frames relating to typical workplace activities.

Unit MEM 25.1A A Apply fibre-reinforced materials

Band – Specialisation band A

Field – Marine vessel construction

Unit Weight 2

This unit covers the competencies required for applying and forming/shaping fibre-reinforced materials. It covers the use of manual and mechanical methods using a variety of glass reinforcements and other fibres. Typical applications include marine vessel and aircraft construction.

Pre-requisite units - Path 1

13.3A Work safely with industrial chemicals and materials

18.1A Use hand tools

18.2A Use power tools/hand held operations

Element 25.1A.1 Prepare for application/forming operations

Criteria 25.1A.1.1

Appropriate tools and equipment selected according to organisational requirements and instructions.

Assessor guide: observe that –

Appropriate equipment is selected for the application/forming job. Equipment is checked for

Assessor guide: confirm that –

Use of tools and equipment for application/forming operations can be given.

Criteria 25.1A.1.2

Equipment is set up and adjusted ready for operation, in accordance with standard operating procedures.

Assessor guide: observe that –

Equipment is set up in a safe manner and settings are adjusted to suit the application requirements.

Assessor guide: confirm that –

Procedures for setting up and adjusting equipment can be given.

Criteria 25.1A.1.3

Required specifications are identified.

Assessor guide: observe that –

Work instructions are interpreted and where necessary, clarified before commencing operations.

Assessor guide: confirm that –

Terminology and information relevant to standard work instructions can be given. Applicable codes and regulations can be given.

Criteria 25.1A.1.4

Materials are selected according to job specifications.

Assessor guide: observe that –

Appropriate materials are selected to suit different operations.

Assessor guide: confirm that –

Different materials and their properties can be given.

Criteria 25.1A.1.5

Allowances for thickness to specifications are made.

Assessor guide: observe that –

Correct allowance is made to suit the conditions and specifications.

Assessor guide: confirm that –

The importance and relevance of thickness allowances can be given.

Element 25.1A.2 Apply reinforced materials

Criteria 25.1A.2.1

Components are positioned ready for reinforcement operation.

Assessor guide: observe that –

All components are placed in correct position using accepted methods.

Assessor guide: confirm that –

Techniques for positioning components can be given.

<p>Criteria 25.1A.2.2 Equipment is started up, shut down and operated according to standard operating procedures.</p>	<p><i>Assessor guide: observe that –</i> Operating procedures are correctly followed.</p>	<p><i>Assessor guide: confirm that –</i> Safety requirements and start up/shut down/operating procedures can be given.</p>
<p>Criteria 25.1A.2.3 Safe working practices are followed, including the use of personal protective equipment.</p>	<p><i>Assessor guide: observe that –</i> Material and safety guards correctly positioned, safe working practices applied and appropriate personal protective equipment is worn.</p>	<p><i>Assessor guide: confirm that –</i> Safe working practices and safe use of personal protective equipment can be given.</p>
<p>Element 25.1A.3 Form and shape reinforcement materials</p>		
<p>Criteria 25.1A.3.1 Materials are rolled/shaped to specified thicknesses and/or finishes.</p>	<p><i>Assessor guide: observe that –</i> Material is correctly rolled/shaped using accepted techniques and timeframes. Irregularities are smoothed out.</p>	<p><i>Assessor guide: confirm that –</i> Methods for rolling and shaping can be given. Problems associated with rolling and shaping and methods for rectifying can be given.</p>
<p>Criteria 25.1A.3.2 Materials are laminated according to specifications.</p>	<p><i>Assessor guide: observe that –</i> Correct lamination sequence is followed.</p>	<p><i>Assessor guide: confirm that –</i> The lamination sequence is explained and its importance can be given.</p>
<p>Criteria 25.1A.3.3 Final application and shape is checked for compliance to specifications and adjusted as necessary.</p>	<p><i>Assessor guide: observe that –</i> Compliance to specification is established. Required adjustments are identified and carried out.</p>	<p><i>Assessor guide: confirm that –</i> Methods of checking final application and form can be given.</p>

Range statement

Work may be undertaken autonomously or as part of a team. Predetermined standards of quality and safety are observed and work is carried out following standard operational procedures. Application and forming operations conducted within a mould or over a former assembly. Tasks may include hand and mechanical lay-up practices, sheathing applications using resins, adhesives, sealants and fillers, core material for stiffening applications. Typical applications may include hull, deck, superstructures, bulkhead and partitions, transverse and longitudinal frame members, engine beds and tanks. Materials may include a variety of glass reinforcements and other fibres, types of laminating resins, stiffening materials such as foams, core mat etc. Tools and equipment may include appropriate brushes and rollers, metal rollers, gelcoat and resin depositors. All work and work practices are undertaken to regulatory and legislative requirements. Forming and integration work and vacuum bagging techniques are covered by Unit 25.2 A (Form and integrate fibre-reinforced structures). This unit should not be selected if Unit 25.2A (Form and integrate fibre-reinforced structures) has already been selected.

Evidence guide**Assessment context**

This unit may be assessed on the job, off the job, or a combination of on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the application and forming of fibre reinforced materials or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 25.2A A Form and integrate fibre-reinforced structures

Band – Specialisation band A

Field – Marine vessel construction

Unit Weight 4

This unit covers the competencies required for applying, forming and integrating fibre-reinforced components. It covers the use of manual and mechanical methods using a

variety of glass reinforcements and other fibres. Typical applications include marine vessel and aircraft construction.

Pre-requisite units - Path 1

13.3A Work safely with industrial chemicals and materials

18.1A Use hand tools

18.2A Use power tools/hand held operations

Element 25.2A.1 Form components

Criteria 25.2A.1.1

Relevant materials for component construction are selected.

Assessor guide: observe that –

Required fibre-reinforced materials and components are selected from drawings and job instructions. Appropriate laminated resins, associated hardeners, release agents, pigment additives are selected.

Assessor guide: confirm that –

Typical components, materials, resins and hardeners, release agents, pigment additives can be identified and their uses given. Fibre-reinforced materials and common high-performance materials can be identified.

Criteria 25.2A.1.2

Relevant drawings and templates are selected.

Assessor guide: observe that –

Associated drawings/templates for construction process are selected.

Assessor guide: confirm that –

Drawings and templates can be identified and their construction role explained. Applicable codes and regulations can be given.

Criteria 25.2A.1.3

Components formed to specifications

Assessor guide: observe that –

Hand tools, power tools, workshop equipment and machinery are selected and used safely and in accordance with job requirements. Appropriate personal protective equipment is worn and safety practices followed. Waste is disposed of in an environmentally sustainable manner in accordance with legislative requirements.

Assessor guide: confirm that –

Appropriate hand tools, power tools, workshop equipment and machinery are identified and their use explained. Personal protective equipment and safety practices can be given. Waste disposal obligations and regulations can be given.

Criteria 25.2A.1.4

Component sizing matches the appropriate template.

Assessor guide: observe that –

Dimension size of component is checked against template.

Assessor guide: confirm that –

Method used to check component size against relevant template can be given.

Element 25.2A.2 Integrate components

Criteria 25.2A.2.1

Integration requirements, materials fixing/bonding methods and mixing practices are determined from job specifications and manufacturer specifications.

Assessor guide: observe that –

Appropriate fixing/bondage materials are selected and mixing procedure applied correctly.

Assessor guide: confirm that –

Procedures used to install component, fixing/bondage and mixing application can be given. Method of component integration can be identified.

<p>Criteria 25.2A.2.2 Equipment is set up and adjusted according to standard operating procedures.</p>	<p><i>Assessor guide: observe that –</i> Equipment such as resin/roving depositor gun, vacuum bagging equipment set up and operational adjustments made in accordance with workshop procedures.</p>	<p><i>Assessor guide: confirm that –</i> Procedures required in setting up and adjusting equipment can be given.</p>
<p>Criteria 25.2A.2.3 Components are fixed/bonded in accordance with job requirements and specifications.</p>	<p><i>Assessor guide: observe that –</i> Adhesive/filler materials are selected and fixing/bondage methods applied for component integration. Appropriate personal protective equipment is worn and safety practices followed.</p>	<p><i>Assessor guide: confirm that –</i> Relevant adhesive/filler and fixing/bondage methods can be given. Personal protective equipment and safety practices can be given.</p>
<p>Criteria 25.2A.2.4 Reinforcement materials are formed/shaped to specifications.</p>	<p><i>Assessor guide: observe that –</i> Foams, timber/plywood reinforcements are cut and shaped/bevelled to specification. Tools/machinery selected to suit job requirements. Appropriate personal protective equipment is worn and safety practices followed.</p>	<p><i>Assessor guide: confirm that –</i> Reinforcement materials can be identified. Procedures for forming/ shaping and tools/machinery used can be given. Personal protective equipment and safety practices can be given.</p>
<p>Criteria 25.2A.2.5 Component is prepared for encapsulation process.</p>	<p><i>Assessor guide: observe that –</i> Excess fixing/bondage material is cleaned off. Appropriate personal protective equipment is worn and safety practices followed. Waste is disposed of in an environmentally sustainable manner in accordance with legislative requirements.</p>	<p><i>Assessor guide: confirm that –</i> Importance of cleaning excess fixing/bondage material is explained. Personal protective equipment and safety practices can be given. Waste disposal obligations and regulations can be given.</p>
<p>Element 25.2A.3 Undertake post-curing of materials</p>		
<p>Criteria 25.2A.3.1 Post-curing method is selected to suit job application.</p>	<p><i>Assessor guide: observe that –</i> Appropriate method of post-curing is selected according to the job application and/or job instructions/verbal instructions.</p>	<p><i>Assessor guide: confirm that –</i> Post-curing methods, procedures and applications can be given.</p>
<p>Criteria 25.2A.3.2 Equipment/accessories for post-curing set-up.</p>	<p><i>Assessor guide: observe that –</i> Operational procedures and safety requirements are followed.</p>	<p><i>Assessor guide: confirm that –</i> Equipment/accessories and safe operating procedures can be given.</p>
<p>Criteria 25.2A.3.3 Equipment/accessories are stored according to standard procedure.</p>	<p><i>Assessor guide: observe that –</i> Equipment/accessories are disassembled, cleaned and stored in an appropriate place.</p>	<p><i>Assessor guide: confirm that –</i> Storage procedure can be given.</p>

Range statement

Work may be undertaken autonomously or as part of a team. Predetermined standards of quality and safety are observed and work is carried out following operating procedures. Component construction carried out for mould installation and application and forming operations conducted within a mould or over a former assembly. Typical applications may include hand and mechanical lay-up practices, post curing practices, core materials for stiffening application, sheathing applications using resins, adhesives, sealants and fillers and vacuum bagging techniques where applicable. Product/components constructed may include hull, deck, superstructures, bulkhead and partitions, transverse and longitudinal framing, engine beds and tanks etc. Materials may include a variety of glass reinforcements and other fibres, types of laminating resins, other types of stiffening materials such as foams, core mat etc. Tools and equipment used for laminating work may include brushes and rollers, metal roller, gelcoat and resin depositors and vacuum bagging equipment. A variety of hand and power tools and workshop machinery can be used for component construction and installation practices. Where mark off/out skills are required then Unit 12.7A (Mark off/out structural fabrications and shapes) should also be selected.

Evidence guide**Assessment context**

This unit may be assessed on the job, off the job, or a combination of on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the construction, application, forming and integration of fibre reinforced materials or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 25.3A A Set up marine vessel structures

Band – Specialisation band A

Field – Marine vessel construction

Unit Weight 4

This unit covers the competencies required for setting up marine vessel structures. It includes straightforward levelling and alignment. Erection of metal structures is covered by Unit 10.1A (Erect structures).

Pre-requisite units - Path 1

9.2A Interpret technical drawing

18.2A Use power tools/hand held operations

12.7A Mark off/out structural fabrications and shapes

18.1A Use hand tools

Element 25.3A.1 Inspect and prepare site

Criteria 25.3A.1.1

The site is checked for location, dimensions and levels in accordance with industry standards.

Assessor guide: observe that –

Practices for checking construction site location dimension and levelling procedures are correctly applied.

Assessor guide: confirm that –

Practices used for checking construction site location, dimensions and levelling procedures can be given.

Criteria 25.3A.1.2

Minor alterations, corrections or adjustments are undertaken with approval of appropriate authority.

Assessor guide: observe that –

Procedures used in minor alterations, correction or adjustments are applied.

Assessor guide: confirm that –

Procedures for authorised minor alterations, correction or adjustment can be given.

Criteria 25.3A.1.3

Surfaces and materials/components are prepared for use.

Assessor guide: observe that –

Assessor guide: confirm that –

Practices used to prepare surfaces, materials/component structures can be given.

Criteria 25.3A.1.4

Structural components and materials are identified

Assessor guide: observe that –

Relative structural components and material species are identified and confirmed against job specification.

Assessor guide: confirm that –

Structural components and material species/types can be given in accordance with job specifications.

Element 25.3A.2 Undertake levelling and measurement readings

Criteria 25.3A.2.1

Principles of levelling and measurement reading are applied.

Assessor guide: observe that –

Assessor guide: confirm that –

Process for obtaining levelling and measurement reading can be given.

Criteria 25.3A.2.2

Task requirements are determined

Assessor guide: observe that –

Appropriate levelling and measurement tools/method selected from inspection of equipment/component assembly to be levelled.

Assessor guide: confirm that –

Levelling and measurement tools/methods can be given.

Criteria 25.3A.2.3 Levelling procedures are identified.	<i>Assessor guide: observe that –</i> Method used for levelling application can be identified.	<i>Assessor guide: confirm that –</i> Levelling method used to level equipment /component assembly structure can be given.
Criteria 25.3A.2.4 Levelling equipment is selected and set up to operating procedures.	<i>Assessor guide: observe that –</i> Appropriate levelling equipment selected and set up in accordance with job requirements.	<i>Assessor guide: confirm that –</i> Levelling equipment can be identified and set-up procedure given.
Criteria 25.3A.2.5 Levelling measurements are taken accurately.	<i>Assessor guide: observe that –</i> Accurate measurements are made and levelling requirements identified. Appropriate engineering principles, techniques, tools and measuring equipment are used.	<i>Assessor guide: confirm that –</i> Appropriate engineering principles, techniques, tools and equipment for levelling and measurement can be given.
Criteria 25.3A.2.6 Levelling tasks are completed to specifications.	<i>Assessor guide: observe that –</i> Specifications are correctly interpreted and correct levelling achieved.	<i>Assessor guide: confirm that –</i>
Element 25.3A.3 Erect marine vessel structures		
Criteria 25.3A.3.1 All work is carried out safely and in accordance with defined procedures.	<i>Assessor guide: observe that –</i> Safety aspects of work requirements, such as correct assembly and fixing procedures are identified and applied.	<i>Assessor guide: confirm that –</i> Personal protective equipment and safe working practices can be given. Safety principles for erecting structures can be given.
Criteria 25.3A.3.2 Components of structure are prepared correctly for sequential erection.	<i>Assessor guide: observe that –</i>	<i>Assessor guide: confirm that –</i> Sequence of assembly of component structure can be given.
Criteria 25.3A.3.3 Components are erected and fixed according to specifications.	<i>Assessor guide: observe that –</i> Relevant component erection and fixing practices comply with requirements of job specifications.	<i>Assessor guide: confirm that –</i> Erection and fixing methods can be given.
Criteria 25.3A.3.4 Structure alignment meets required specifications. adjustments are made to achieve correct specifications.	<i>Assessor guide: observe that –</i> Alignment requirements are established. Appropriate	<i>Assessor guide: confirm that –</i>

Range statement

Work undertaken individually or as part of team environment. Structures include composite, metal and timber requiring a location/erection process. Structures would typically be of those where fairness and load bearing is critical and/or where building/marine regulations may apply. Specifications for the structure supplied via engineering drawings or similar and include site location information. Structures include framework such as hull framing, deck framing, superstructures, jig construction, stairways, walkways, tanks, platforms, cradles etc., completed prior to commencement of installation work. Levelling and alignment undertaken is of a straightforward nature, which may include plumb bob/lines, spirit levels, water and dumpy levels etc. This unit does not include fixed structures, such as jetties, wharves, moorings etc. Materials include timber and other non-metallic materials. Where erection of metal structures is required to Unit 10.1A (Erect structures) should be selected. Where construction and assembly of marine timber components is undertaken, Unit 25.5A (Construct and assemble marine timber components) should be selected. Where lifting or rigging skills are required, appropriate materials handling units should be

Evidence guide**Assessment context**

This unit may be assessed on the job, off the job, or a combination of on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with setting up marine timber structures or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 25.4A A Fair and shape surfaces

Band – Specialisation band A

Field – Marine vessel construction

Unit Weight 2

This unit covers the competencies required for filling, sanding, fairing and grinding practices to achieve uniform or correct contours and surfaces. Typical applications include marine vessel construction and the manufacture of transport vehicles.

Pre-requisite units - Path 1

13.3A Work safely with industrial chemicals and materials

18.1A Use hand tools

18.2A Use power tools/hand held operations

Element 25.4A.1 Determine requirements for operation

Criteria 25.4A.1.1

Job requirements are identified.

Assessor guide: observe that –

Job requirements are determined from specification, verbal instructions or visual inspection. Materials to be prepared are identified.

Assessor guide: confirm that –

From specifications, verbal instructions or visual inspection procedures for operation can be explained. Species of material to be prepared can be identified and features/specific preparation requirements and techniques given.

Criteria 25.4A.1.2

Sequence of operations is determined.

Assessor guide: observe that –

Steps used for filling/sanding/grinding, fairing and shaping are identified in accordance with job requirements.

Assessor guide: confirm that –

Steps for fairing and shaping operations can be given.

Element 25.4A.2 Prepare for filling/sanding/grinding operations

Criteria 25.4A.2.1

Safety equipment is set up in accordance with standard procedure.

Assessor guide: observe that –

Where applicable, safety equipment such as fans, extraction unit are set up in accordance with work place procedures.

Assessor guide: confirm that –

Relevant safety equipment can be identified and uses/application given.

Criteria 25.4A.2.2

Appropriate fillers and abrasive materials selected and prepared to suit job requirements and required surface finish.

Assessor guide: observe that –

Fillers and abrasive materials are prepared correctly.

Assessor guide: confirm that –

Fillers and their properties can be given. Surface finish, abrasive discs, belts and other material and coarse grinding can be identified and related to job requirements.

Criteria 25.4A.2.3

Appropriate equipment and accessories selected and set up ready for operation.

Assessor guide: observe that –

Relevant sanding/grinding, power tools such as disc sander, angle grinder and associated safety accessories such as dust extraction assemblies and guard protection are set up correctly.

Assessor guide: confirm that –

Equipment and accessories can be identified and applications given. Safe operating practices and personal protective equipment use can be given.

Element 25.4A.3 Perform filling, sanding, fairing and grinding operations**Criteria 25.4A.3.1**

Work is carried out to specified finishes.

Assessor guide: observe that –

Operator demonstrates surface filling, sanding, internal and external sanding and flat, concave and convex surfaces.

Assessor guide: confirm that –

Filling, sanding, fairing and grinding practices to achieve specified finishes can be given.

Criteria 25.4A.3.2

Power tools are used to optimise equipment and material use.

Assessor guide: observe that –

Operator utilises power tools in correct manner to maximise efficiency and effectiveness of abrasive materials equipment.

Assessor guide: confirm that –

The importance of optimising life of abrasive materials can be given.

Criteria 25.4A.3.3

Safety procedures are observed, safety glasses/shield worn and, where applicable, protective clothing worn.

Assessor guide: observe that –

Personal safety protection is worn to suit specific job requirements and conditions.

Assessor guide: confirm that –

Personal safety procedures and protective equipment relevant to sanding/grinding practices can be identified. Safety hazards relating to faired materials, fillers and abrasives can be given.

Criteria 25.4A.3.4

Surfaces checked to ensure compliance to specifications.

Assessor guide: observe that –

Surface and finish checked visually and by use of fairing battens, straightedges, stringlines, french curves, templates etc. and verified in accordance with job specification.

Assessor guide: confirm that –

In accordance with surface and finish requirements, practices and equipment used to check correct finish can be given.

Range statement

This unit covers filling, sanding, fairing and grinding practices to achieve uniform or correct contours and surfaces, typically on marine vessels and other transport vehicles. Work undertaken autonomously and to predetermined standards of quality and safety. Work is carried out following standard operational procedures. Typical construction materials may include timber, fibre-reinforced materials and metal materials of new and pre-coated surface area. A selection of hand and power tools may include electric or pneumatic disc, orbital and belt sanders, straight and angle grinders. Die grinders may be used for certain applications but should not be used as the sole tool for assessment purposes. A variety of fillers and abrasive materials of different grades are used to suit job application. Where slipping is required, or when working on a slipped craft, Unit 25.14A (Perform marine slipping operations) should also be selected. Relevant units related to specific applications and materials should also be selected as required.

Evidence guide**Assessment context**

This unit may be assessed on the job, off the job, or a combination of on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with fairing and shaping surfaces or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 25.5A A Construct and assemble marine vessel timber components

Band – Specialisation band A

Field – Marine vessel construction

Unit Weight 8

This unit covers the competencies required for constructing and assembling marine timber components, including laminating by cold processes.

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices

9.2A Interpret technical drawing

18.2A Use power tools/hand held operations

4.18A General woodworking machine operations

12.7A Mark off/out structural fabrications and shapes

9.1A Draw and interpret sketch

18.1A Use hand tools

Element 25.5A.1 Determine job requirements

Criteria 25.5A.1.1

Required information is determined from drawings, instructions and specifications.

Assessor guide: observe that –

All relevant specifications, drawings, instructions and procedures are obtained in accordance with work place procedures. Job structure, templates, material types are identified.

Assessor guide: confirm that –

The specifications to be achieved can be identified. A variety of component types, materials and templates can be identified. Specifications of species, durability, strength and appearance can be explained. Applicable codes and regulations can be given.

Criteria 25.5A.1.2

Construction process is selected to suit job application.

Assessor guide: observe that –

Construction detail and assembly practices are identified in accordance with specific job.

Assessor guide: confirm that –

Methods used to construct and assemble components can be given. Affect on access, rigidity, strength, buoyancy, resistance to stresses encountered at sea can be described, where appropriate.

Element 25.5A.2 Construct marine vessel timber components

Criteria 25.5A.2.1

Appropriate tools/equipment are selected to suit job application.

Assessor guide: observe that –

Tools and equipment requirements of application. Materials chosen meet specifications in terms of species, grade and quality.

Assessor guide: confirm that –

Hand tools, power tools and workshop machinery to suit construction applications can be given. Appropriateness of species and quality specifications and be explained.

Criteria 25.5A.2.2

Template/measurement is selected to suit component construction.

Assessor guide: observe that –

Appropriate templates, measurements for construction of component are selected.

Assessor guide: confirm that –

Relevant templates/measurements, associated with component construction can be given.

Criteria 25.5A.2.3

Material is dressed, sized and shaped to suit job requirements and specifications.

Assessor guide: observe that –

Appropriate hand and power tools, workshop machinery are selected to suit dressing, sizing and shaping process. Materials are formed to suit job specifications.

Assessor guide: confirm that –

Practices used in dressing, sizing and shaping of material can be given. The candidate identifies strength, durability and appearance characteristics of selected materials.

Criteria 25.5A.2.4

Final form/shape of component is checked against template/measurement specification and modified if necessary.

Assessor guide: observe that –

Methods used to check final form/shape of component against template/measurements and modify where necessary are identified.

Assessor guide: confirm that –

Procedures used in checking final form/shape and where necessary modify component can be given.

Criteria 25.5A.2.5

Component identification and set-up markings are applied.

Assessor guide: observe that –

Relevant markings associated with identification and setting up of component, off template/plan are obtained.

Assessor guide: confirm that –

Relevancy of component identification and setting up markings can be given.

Element 25.5A.3 Assemble components**Criteria 25.5A.3.1**

Jig support assembly is set up to suit job requirements.

Assessor guide: observe that –

Where applicable, from given plans or component structure procedures used to assemble a support jig are identified.

Assessor guide: confirm that –

Where applicable, methods used in assembling a support jig to suit job requirement can be given.

Criteria 25.5A.3.2

Assembly and fastening sequence is determined.

Assessor guide: observe that –

Appropriate fasteners, fastening method and material species are selected.

Assessor guide: confirm that –

Procedures, codes and regulations used in applying relevant fastenings to suit assembly can be given. Fasteners and material species can be given.

Criteria 25.5A.3.3

Material preservation requirements are carried out, if required.

Assessor guide: observe that –

Preservation materials applied to component in accordance with job requirement.

Assessor guide: confirm that –

Preservation materials can be identified, their uses given and safety precautions to be observed explained.

Criteria 25.5A.3.4

Components are assembled to specified line markings and positions.

Assessor guide: observe that –

Assembly line markings are identified and components positioned in accordance with specific markings.

Assessor guide: confirm that –

Purpose of component assembly markings can be given.

Criteria 25.5A.3.5

Assembled component meets specifications.

Assessor guide: observe that –

Components are assembled in accordance with job requirements and checked against template or specifications.

Assessor guide: confirm that –

Size specification of assembled component can be given.

Criteria 25.5A.3.6

Component assembly is cleaned/prepared to suit job requirements.

Assessor guide: observe that –

Excess material wastage is cleaned off and component prepared in accordance with workplace practices. Waste is disposed of in an environmentally sustainable manner in accordance with legislative requirements.

Assessor guide: confirm that –

Practices used in cleaning and finish preparation of component can be explained. Waste disposal obligations and regulations can be given.

Range statement

Work may be undertaken autonomously or as part of a team. Predetermined standards of quality and safety are observed and work is carried out following operating procedures. Component materials may be hardwood, softwood or plywood sheeting, or combinations of two or more of the three. Components constructed and assembled may include marine vessel backbone components such as keel, deadwoods, stem etc., transverse and longitudinal framing, knees, deck framing, hull construction, laid deck construction and superstructures. Where hull is to be planked, planking may include, but not be limited to, carvel, strip, clinker, double diagonal systems, etc. Fastenings, joining methods and sealing systems may vary according to application. Materials for fastening, joining and sealing may include marine-grade adhesives, sealant and caulking materials, metal fasteners including copper, silicon bronze, monel and stainless steel etc. Timber joinery must be appropriate for application and fixed to industry standards. This unit includes laminating by cold processes. Where permanent timber bending practices are required, such as boiling/steam bending, Unit 25.9 A (Form timber shapes using hot processes) should also be selected. A variety of hand and hand-held power tools and workshop equipment such as bandsaw, surfacer and thicknesser etc. may be used for the construction and assembly

Evidence guide**Assessment context**

This unit may be assessed on the job, off the job, or a combination of on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with constructing and assembling timber components used in marine vessel manufacture or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 25.6A A Undertake marine sheathing operations

Band – Specialisation band A

Field – Marine vessel construction

Unit Weight 2

This unit covers the competencies required for the application of sheathing to marine structures (sheathing operations). Basic composite sheathing operations are covered by Unit 25.1A (Apply fibre-reinforced materials)

Pre-requisite units - Path 1

13.3A Work safely with industrial chemicals and materials
25.4A Fair and shape surfaces

18.1A Use hand tools

18.2A Use power tools/hand held operations

Element 25.6A.1 Identify job requirements

Criteria 25.6A.1.1

Job specifications are identified from written and verbal instructions as appropriate.

Assessor guide: observe that –
Sheathing application, material and other relevant specifications are identified.

Assessor guide: confirm that –
Specifications and instructions for sheathing operation can be given.

Criteria 25.6A.1.2

Surface materials are identified from specification or verbal instructions.

Assessor guide: observe that –
Surface materials are correctly identified.

Assessor guide: confirm that –

Criteria 25.6A.1.3

Application schedules are identified.

Assessor guide: observe that –
Material application procedure, in accordance with job requirements are identified.

Assessor guide: confirm that –
Procedures of applying materials can be given.

Element 25.6A.2 Observe safety practices

Criteria 25.6A.2.1

Application material is prepared in accordance with manufacturer specifications.

Assessor guide: observe that –
Sheathing material lengths measured to produce minimal wastage. Resin mix ratios are clarified in accordance with manufacturer specifications.

Assessor guide: confirm that –
Preparation of materials for sheathing process can be given.

Criteria 25.6A.2.2

Work area is made safe in accordance with organisational and legislative requirements.

Assessor guide: observe that –
Work site is prepared for obstruction-free work environment.

Assessor guide: confirm that –
Practices used for establishing and maintaining a safe work site can be given.

Criteria 25.6A.2.3

Safety practices are observed and appropriate protective clothing is worn.

Assessor guide: observe that –
Appropriate protective clothing/equipment is used, such as safety glasses, rubber gloves and other clothing.

Assessor guide: confirm that –
Relevant safety practices can be given. Relevant protective clothing/equipment can be given. Safety issues relevant to sheathing application can be given.

Element 25.6A.3 Prepare surface areas and application materials**Criteria 25.6A.3.1**

Surface area is prepared to suit job application.

Assessor guide: observe that –

Surface area prepared in accordance with job requirements.
Appropriate sanding tools/equipment selected.

Assessor guide: confirm that –

Procedures used in surface preparation can be given.

Criteria 25.6A.3.2

Surface contaminants are removed using appropriate method.

Assessor guide: observe that –

Appropriate equipment and materials are selected and used correctly. Contaminants are removed to specification.

Assessor guide: confirm that –

Procedures used in removal of surface contaminants can be given.

Criteria 25.6A.3.3

Where applicable, non-contact surface areas are protected.

Assessor guide: observe that –

Surface areas not being sheathed are protected against spillage, excess resin run-off by appropriate means.

Assessor guide: confirm that –

Procedures used to protect non-contact surface can be given.

Criteria 25.6A.3.4

Measures to prevent external contamination are applied in accordance with organisational procedures.

Assessor guide: observe that –

Surface areas are suitably covered/shielded during material application using appropriate materials/equipment.

Assessor guide: confirm that –

Practices, materials and equipment used for prevention of contamination can be given.

Criteria 25.6A.3.5

Appropriate equipment is used to calibrate mixing quantities.

Assessor guide: observe that –

Mixing quantities are correctly calculated using appropriate equipment.

Assessor guide: confirm that –

Correct use of mixing utensils can be given. Equipment for calculating mixing quantities such as scales, measurement stick, calibrated pumps, can be identified.

Element 25.6A.4 Prepare application materials**Criteria 25.6A.4.1**

Materials are prepared/mixed in accordance with manufacturer specification.

Assessor guide: observe that –

Sheathing matting, cloths etc; resin preparation/mixing procedures can be identified in accordance with job requirements.

Assessor guide: confirm that –

Procedures used in preparing/mixing of sheathing materials can be given.

Criteria 25.6A.4.2

Material quantities are calculated and cut to produce minimum wastage.

Assessor guide: observe that –

Appropriate cutting tools are selected for specified sheathing material. Wastage is minimised.

Assessor guide: confirm that –

Sheathing cutting tools can be identified for different materials and applications. Techniques for minimising wastage can be given.

Element 25.6A.5 Apply materials**Criteria 25.6A.5.1**

Application tools are selected and used correctly. roller, rubber squeegee are demonstrated.

Assessor guide: observe that –

Correct selection/usage of paint brush/paint roller, metal identified and their uses given.

Assessor guide: confirm that –

Appropriate hand tools for resin application can be

Criteria 25.6A.5.2

Application procedures are carried out in accordance with manufacturer specification.

Assessor guide: observe that –

Appropriate techniques in applying materials can be demonstrated.

Assessor guide: confirm that –

Procedures used in applying materials, as per manufacturer specifications, can be given.

Criteria 25.6A.5.3

Where applicable, job materials are held securely in place until curing process is achieved.

Assessor guide: observe that –

If applicable, matting/cloth and waste overhang is secured by appropriate fixing method and fastener e.g. staples, masking tape

Assessor guide: confirm that –

Where applicable, practices used to secure materials and waste overhang can be given.

Criteria 25.6A.5.5

Excess material is removed.

Assessor guide: observe that –

Excess materials are removed to produce minimum sanding/finishing requirements. Waste is disposed of in an environmentally sustainable manner in accordance with legislative requirements.

Assessor guide: confirm that –

Practices used in removal of excess resin, to minimise sanding requirements, can be given. Waste disposal obligations and regulations can be given.

Criteria 25.6A.5.6

Application tools are cleaned up and stored.

Assessor guide: observe that –

Tools are cleaned and stored using appropriate cleaners/solvent. Waste is disposed of in an environmentally sustainable manner in accordance with legislative requirements.

Assessor guide: confirm that –

Practices used for cleaning and storage of tools can be given. Waste disposal obligations and regulations can be given.

Criteria 25.6A.5.7

Job area is cleaned up to maximise safe working conditions.

Assessor guide: observe that –

Area is cleaned and potential hazards removed. Waste is disposed of in an environmentally sustainable manner in accordance with legislative requirements.

Assessor guide: confirm that –

Practice used for clean up of excess wastage materials in work site can be given. Waste disposal obligations and regulations can be given.

Element 25.6A.6 Seal fabricated components**Criteria 25.6A.6.1**

Surface preparation is completed as per manufacturer's specification.

Assessor guide: observe that –

Appropriate method used to sand/re-coat sheathed surface area. Appropriate sanding machine and abrasive materials are selected. Manufacturer's specifications are followed.

Assessor guide: confirm that –

In accordance with manufacturer specification, practice used for sanding/re-coating can be given.

Criteria 25.6A.6.2

Sealant is applied to components and secured as per specifications and/or drawings.

Assessor guide: observe that –

Correct sealant is selected for sealing fittings. Components/fittings are secured correctly.

Assessor guide: confirm that –

Application of sealant and fastening procedure can be given.

Criteria 25.6A.6.3

Excess sealant is cleaned off and tested/checked to ensure water tightness.

Assessor guide: observe that –

Fitting is cleaned and structurally tested in accordance with workshop quality practices.

Assessor guide: confirm that –

Practices used for clean up and testing for water tightness can be given.

Range statement

This unit covers the application of sheathing to marine structures. Work is undertaken autonomously, in a team environment or a combination of both. Predetermined standards of quality and safety are observed and work is carried out to standard operational procedures. Construction materials may include copper, gal sheet and other metals, fabric, sheathing resins, a range of adhesives, sealants and fillers and where applicable may be applied to timber, fibre-reinforced plastics and metal surface areas. Tasks may be carried out on prepared new and old surface areas. Sealing may involve various materials to ensure a water-tight seal on a variety of components. Hand tools for mixing and application practices may include mixing sticks, putty/broad knives, scales, tins of equal size, trowels, squeegee, brushes and rollers. All work and work practices are undertaken to regulatory and legislative requirements. Where application of marine coatings is undertaken Unit 8.17A Undertake pre-treatment and coating applications should be selected. Basic sheathing operations are covered by Unit 25.1A (Apply fibre-reinforced materials). Where materials and chemicals subject to codes and regulations are stored, Unit 13.3A (Work safely with industrial chemicals and materials) should also be considered.

Evidence guide**Assessment context**

This unit may be assessed on the job, off the job, or a combination of on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the application of marine construction materials (sheathing operations) to surface areas of a boat or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 25.7A A Maintain marine vessel surfaces

Band – Specialisation band A

Field – Marine vessel construction

Unit Weight 4

This unit covers the competencies required to perform cosmetic maintenance/repair of surfaces, including fibre reinforced plastics, timber and metal surfaces.

Pre-requisite units - Path 1

12.7A Mark off/out structural fabrications and shapes

18.2A Use power tools/hand held operations

13.3A Work safely with industrial chemicals and materials

18.1A Use hand tools

Element 25.7A.1 Inspect vessel and identify maintenance/repair requirements

Criteria 25.7A.1.1

Sectors, surfaces and fittings requiring inspection are identified.

Assessor guide: observe that –

Inspection procedures are located and inspection requirements identified. General sectors/fittings are located for inspection. Surface coating and toxicity status of different sectors are identified.

Assessor guide: confirm that –

Different hull and superstructure sectors and associated fittings common to maintenance activities can be given. Surface coatings and toxicity status for specific applications can be given. Standard fittings requiring inspection can be given, including anodes, bearings, shafts, propellers, rudder, skin fittings.

Criteria 25.7A.1.2

Condition of sectors/surfaces and fittings is established.

Assessor guide: observe that –

Breakdowns in surface integrity are identified, such as scuffs, build-ups, cosmetic collision damage, wet points, corrosion and leaks. Common environmental problems associated with specific materials are identified from visual inspection. Fittings are removed if necessary and checked, including anodes, bearings, shafts, propellers, rudder, skin fittings.

Assessor guide: confirm that –

Common environmental problems, and causes of irregularities/breakdowns in surface integrity and fittings can be given.

Criteria 25.7A.1.3

Appropriate maintenance/repair requirements and methods are established.

Assessor guide: observe that –

Degree of breakdowns in surface integrity and implications are assessed. Cosmetic maintenance/repair requirements and are established, including replacement of fittings as appropriate. Appropriate methods and materials for maintenance/repair are selected. Damage extending beyond cosmetic repair/replacement (e.g. star cracking, rot and other impediments to structural and watertight integrity) is reported to appropriate person/s. Relevant surface coating materials and associated health/environmental risks are identified.

Assessor guide: confirm that –

Implications of different surface breakdowns and irregularities can be given. Methods and materials for cosmetic maintenance/repair of surfaces and fittings can be given. Health/environmental preventative measures associated with specific materials can be given.

Element 25.7A.2 Clean and prepare vessel sectors and surfaces**Criteria 25.7A.2.1**

Correct cleaning equipment and materials are selected and used safely.

Assessor guide: observe that –

Appropriate cleaning tools, equipment and materials are selected. Equipment and accessories are used in a safe manner.

Assessor guide: confirm that –

Different cleaning tools, equipment and materials and their applications can be given, including:

- hand tools, such as hand scrapers and scouring pads
- handheld power tools
- abrasive materials and equipment and associated dust extraction accessories
- high-pressure blast cleaning equipment
- chemicals, such as acid wash, solvent, detergent

Safety measures and safe working procedures can be given.

Criteria 25.7A.2.2

Fittings are cleaned and prepared for maintenance.

Assessor guide: observe that –

Hull and topside fittings are removed, if necessary, and cleaned using appropriate methods and materials.

Assessor guide: confirm that –

Procedures and materials for cleaning fittings can be given. Hull and topside fittings include bearings, shafts, propellers, rudder, skin fittings, docking strip, fairleads, gunwhales etc.

Criteria 25.7A.2.3

Surfaces and sectors are cleaned free of contaminants.

Assessor guide: observe that –

Methods for removal of contaminated material from hull and superstructure are applied correctly. Contaminants, including build-up, flaking etc. are removed. Safety measures and safe work procedures are applied. Top side surfaces are cleaned using suitable products.

Assessor guide: confirm that –

Methods for cleaning/washing and removing contaminated materials can be given, including use of acid wash (fibreglass surfaces), solvents, detergents, abrasive and high-pressure water blasting, hand scraping and scouring.

Criteria 25.7A.2.4

Safety practices are applied in accordance with organisational and legislative requirements.

Assessor guide: observe that –

Appropriate personal protective equipment is worn and safety practices followed. Waste is disposed of in an environmentally sustainable manner in accordance with legislative requirements.

Assessor guide: confirm that –

Safe work practices and personal protective equipment can be identified. Waste disposal obligations and regulations can be given.

Element 25.7A.3 Perform cosmetic maintenance/repair**Criteria 25.7A.3.1**

Surfaces are correctly prepared, filled and faired ready for finishing.

Assessor guide: observe that –

Timber hulls and decking are stripped and recaulked as required. Fibreglass chips are touched up using gelcoat. Metal and timber surfaces are filled as appropriate. Preservative/primers are applied correctly to bare surface areas and fittings.

Assessor guide: confirm that –

Bare surface areas requiring pre-treatment can be identified. Preservative/primers/fillers can be identified and their applications given. Methods, materials and tools for preparing, filling and fairing different hull and topside surfaces, including timber, metal and fibreglass can be given.

Criteria 25.7A.3.2

Compatibility of re-coating materials is confirmed.

Assessor guide: observe that –

Compatibility of re-coating materials with specified surface material is determined using manufacturer specification.

Assessor guide: confirm that –

Manufacturer specifications can be interpreted for compatibility information.

Criteria 25.7A.3.3

Material coatings are selected and applied correctly.

Assessor guide: observe that –

Material coatings, such as anti-fouling, gelcoat, varnish and touch-up paint are applied correctly to hull and topside sectors.

Assessor guide: confirm that –

Coatings and relevant application methods can be given for different surface materials.

Criteria 25.7A.3.4

Fittings are maintained/replaced as appropriate.

Assessor guide: observe that –

Minor/cosmetic maintenance/repair carried out to existing fittings if required. Existing and new fittings are correctly installed, including, bearings, shafts, propellers, rudder, skin fittings. Fittings requiring periodic replacement, such as anodes and docking strips, are replaced where necessary.

Assessor guide: confirm that –

Correct fitting types and installation methods/procedures can be established for given vessel. Lubrication, sealants, protective coatings and other materials required for installation and maintenance of fittings can be given.

Criteria 25.7A.3.5

Tools and equipment are cleaned and stored correctly.

Assessor guide: observe that –

Coating application tools are cleaned using appropriate methods and solvents. Tools are stored using appropriate practices.

Assessor guide: confirm that –

Cleaning techniques can be given. Solvents and other cleaning materials can be identified and safety practices given. Storage procedures can be given.

Element 25.7A.4 Finish surfaces**Criteria 25.7A.4.1**

Where applicable, surfaces are re-coated.

Assessor guide: observe that –

Surfaces are re-coated to match/blend with surface finish.

Assessor guide: confirm that –

Tools and equipment for re-coating surfaces can be identified and their function given. Paints, varnishes and other finishes can be identified.

Criteria 25.7A.4.2

Where applicable, surfaces are sanded and buffed/polished to specification.

Assessor guide: observe that –

Finish specifications are established. Correct sanding and buffing/polishing techniques are applied finish hull and topside surfaces.

Assessor guide: confirm that –

Wet/dry sanding, polishing and buffing techniques can be given for different surfaces and materials. Cutting and polishing compounds and their application can be given. Tools and equipment for surfaces can be identified and their function given.

Range statement

This unit covers cosmetic maintenance and repair practices used in the marine industry. Work undertaken autonomously, in a team environment or a combination. Cosmetic maintenance and repair practices apply across a range of timber, fibre reinforced plastics and metal materials. Routine maintenance-related inspection of hull and superstructure sectors, surfaces and fittings. Covers identification of cosmetic environmental and other damage including chips in fibre reinforced plastics, minor corrosion in metal, caulking in timber surfaces, wear and corrosion of fittings etc. A range of hand-held tools, equipment and materials are used to suit specific maintenance/repair requirements. Typical cleaning tools and equipment may include hand scrapers and scouring pads, handheld power tools, abrasive materials and equipment and associated dust extraction accessories, high-pressure blast cleaning equipment and chemical cleaners such as acid wash, solvent, detergent. All work is carried out observing all safety aspects. All work and work practices are undertaken to regulatory and legislative requirements. Where repair of marine surfaces and structures is carried out, Unit 25.8A (Repair marine vessel surfaces and structures) should be selected. Where slipping is required, or when working on a slipped craft, Unit 25.14A (Perform marine slipping operations) should also be selected. Relevant units related to specific applications and materials should also be selected as required.

Evidence guide**Assessment context**

This unit may be assessed on the job, off the job, or a combination of on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with cosmetic maintenance and repair of marine vessel surfaces and fittings or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required for demonstrating competency in this unit. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 25.8A A Repair marine vessel surfaces and structures

Band – Specialisation band A

Field – Marine vessel construction

Unit Weight 4

This unit covers the competencies required to repair marine structures and surfaces, including fibre reinforced plastics, timber and metal surfaces. Cosmetic maintenance/repair of surfaces is covered by Unit 25.7A (Maintain marine vessel surfaces).

Pre-requisite units - Path 1

12.7A Mark off/out structural fabrications and shapes
18.2A Use power tools/hand held operations

13.3A Work safely with industrial chemicals and materials
25.4A Fair and shape surfaces

18.1A Use hand tools
25.7A Maintain marine vessel surfaces

Element 25.8A.1 Determine nature and extent of damage and subsequent repair requirements

Criteria 25.8A.1.1

Damaged structural areas/sectors are identified and extent of damage determined.

Assessor guide: observe that –

From visual inspection, extent of structural damage area/sector is identified.

Assessor guide: confirm that –

Extent of damaged area/sector can be identified. Affect of damage in relation to the capacity of the vessel to withstand stresses encountered at sea can be described.

Criteria 25.8A.1.2

Repair requirements are determined.

Assessor guide: observe that –

Suitable repair method and materials are selected.

Assessor guide: confirm that –

Repair methods and materials for timber, fibre reinforced plastics and metal surfaces and structures can be given. Characteristics of chosen materials can be described. Affect on structural and or watertight integrity can be explained.

Element 25.8A.2 Remove damaged sectors

Criteria 25.8A.2.1

Where applicable damaged sector is reinforced/supported.

Assessor guide: observe that –

Appropriate techniques are used to ensure maintenance of structural and watertight integrity.

Assessor guide: confirm that –

Correct tools/equipment are identified and their usage given. Techniques for reinforcement/shoring/support can be given.

Criteria 25.8A.2.2

Damaged sector is removed.

Assessor guide: observe that –

Tools/equipment used correctly to remove damaged sector
Damaged sector is removed safely.

Assessor guide: confirm that –

Correct tools/equipment are identified and their usage applied.

Element 25.8A.3 Repair damaged sectors

Criteria 25.8A.3.1

Method of component replacement is determined.

Assessor guide: observe that –

Appropriate re-construction method of replacement component selected.

Assessor guide: confirm that –

Method of re-constructing damaged components can be given.

Criteria 25.8A.3.2

Damaged components are repaired/constructed to specification.

Assessor guide: observe that –

Selection and usage of appropriate tools and equipment in repairing/constructing damage components is demonstrated.

Assessor guide: confirm that –

Specification requirements for repair construction can be given.

Criteria 25.8A.3.3

Components are fastened using appropriate fastening practices.

Assessor guide: observe that –

Correct fastening methods are selected and applied. Through hull fittings are reconnected/refitted where necessary and packed /sealed.

Assessor guide: confirm that –

Correct fastening method can be identified and application procedure can be given.

Criteria 25.8A.3.4

Repaired surface area is prepared and re-coated to specifications.

Assessor guide: observe that –

Practices used in preparing and re-coating repaired surface area are applied.

Assessor guide: confirm that –

Procedures used in preparing and re-coating can be given. Purpose of coatings can be stated. Ventilation requirements can be explained.

Criteria 25.8A.3.5

Repairs are cleaned in accordance with delivery requirements.

Assessor guide: observe that –

In accordance with job requirements, procedures used in pre-delivery clean up of damaged sector can be applied. Waste is disposed of in an environmentally sustainable manner in accordance with legislative requirements.

Assessor guide: confirm that –

Procedures used in pre-delivery clean up of damaged sector can be explained. Waste disposal obligations and regulations can be given.

Range statement

This unit covers the competencies required to repair marine structures and surfaces. Work undertaken autonomously, in a team environment or a combination. All practices may be applied to timber, fibre reinforced plastics, polycarbonates, acrylics, glass and metal materials. Repairs may relate to hull, superstructure and decks. Structural repair includes impediments to structural and watertight integrity, for example, holed hull, star-cracking in fibre reinforced plastics, replacement of hull and deck planking, replacement of cracked hatch tops and portlight 'windows', hull penetration causing ingress of water. Repairs may be related to foreign contact damage such as reef, jetty collision and environmental problems such as fungi, marine and insect effects on timber, variants of severe corrosion in metals, such as electrolysis and galvanic corrosion and with fibre reinforced plastics construction, such as osmosis. A range of tools/equipment and materials are used to suit specified job requirements. All work is carried out observing all safety aspects of structural integrity. Chosen repair methods must take account of stresses encountered by vessels at sea including, but not limited to hogging, sagging, wracking, sheering, panting. All work and work practices are undertaken to regulatory and legislative requirements. Where sheathing applications are required Unit 25.6A (Undertake sheathing operations) should also be selected. Where interpretation of technical drawings is required, Unit 9.2A (Interpret technical drawing) should also be selected. Where location/erection of structures is required, Unit 25.3A (Set up marine vessel structures) should also be selected. Where mechanical systems/components/fittings are to be replaced, Unit 18.55A should be selected. Where slipping is required, or when working on a slipped craft, Unit 25.14A (Perform marine slipping operations) should also be selected. Relevant units related to specific applications and materials should also be selected as required.

Evidence guide**Assessment context**

This unit may be assessed on the job, off the job, or a combination of on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the repair of marine surfaces and structures or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required for demonstrating competency in this unit. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 25.9A A Form timber shapes using hot processes

Band – Specialisation band A

Field – Marine vessel construction

Unit Weight 2

This unit covers the competencies required for forming solid timber shapes using hot processes. Laminating by cold processes is covered by Unit 25.5A (Construct and assemble marine timber components)

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices

9.2A Interpret technical drawing

18.2A Use power tools/hand held operations

4.18A General woodworking machine operations

12.7A Mark off/out structural fabrications and shapes

9.1A Draw and interpret sketch

18.1A Use hand tools

Element 25.9A.1 Determine job requirements

Criteria 25.9A.1.1

Specifications are identified from drawings and instructions.

Assessor guide: observe that –

Relevant drawings, instructions and specifications are identified.

Assessor guide: confirm that –

Relevant job specifications can be given.

Criteria 25.9A.1.2

Appropriate bending process is selected and components identified.

Assessor guide: observe that –

Component structure and associated bending practice is identified.

Assessor guide: confirm that –

Forming and component assembly practices can be given. Heating times, temperatures and humidity requirements, where appropriate, can be stated. Suitability characteristics of materials used can be described. Faults in material, such as twist, shakes, sloping grain, can be identified.

Criteria 25.9A.1.3

Construction sequence is determined.

Assessor guide: observe that –

Steps for construction of components are identified.

Assessor guide: confirm that –

Forming and component assembly practice can be given.

Element 25.9A.2 Prepare jigs and templates

Criteria 25.9A.2.1

Standard jigs/templates are selected to suit job application.

Assessor guide: observe that –

Associated jig/template relevant to form application are selected. Safety measures are applied and personal protective equipment used as appropriate.

Assessor guide: confirm that –

Jig/templates are identified and their uses explained.

Criteria 25.9A.2.2

Jigs/templates are constructed to suit required shape.

Assessor guide: observe that –

Jig/templates conform to required shape. Appropriate tools/equipment are used.

Assessor guide: confirm that –

Jig/template construction process, to suit specified shape, can be explained.

Element 25.9A.3 Form timber shapes**Criteria 25.9A.3.1**

Components are constructed to specifications using hot processes.

Assessor guide: observe that –

In accordance with the selected heating and bending processes, components are constructed to specifications.

Assessor guide: confirm that –

Bending and forming processes used for constructing components can be given.

Criteria 25.9A.3.2

Where applicable, laminating/heating equipment is set up according to standard operating procedures observing safety practices.

Assessor guide: observe that –

Observing safety practices laminating/heating equipment, such as cramps, steambox/pot are set up in accordance with standard operating procedures.

Assessor guide: confirm that –

Relevant laminating/heating equipment can be identified, their use and safety procedures can be given.

Criteria 25.9A.3.3

Components are constructed and shaped to specifications.

Assessor guide: observe that –

Using heating processes, applying safety practices, components are constructed in accordance with job requirements and specifications.

Assessor guide: confirm that –

Procedures used in heating, construction and shaping of components can be given.

Criteria 25.9A.3.4

Final components conform to specifications.

Assessor guide: observe that –

Component size is checked in accordance with job specifications. Component is adjusted if necessary to achieve specifications.

Assessor guide: confirm that –

Procedures for checking specified component size can be given.

Range statement

This unit covers the competencies required for forming solid timber shapes using hot processes. Work may be undertaken autonomously or as part of a team. Predetermined standards of quality and safety are observed and work is carried out following standard operational procedures. Application and forming operations conducted within a mould, existing structure or over a former assembly. Typical applications in construction of marine vessels include forming and shaping of structural and decorative components. Tools and equipment may include jigs, templates, steamboxes, cramps, fasteners etc. All work and work practices are undertaken to regulatory and legislative requirements. Where straightforward construction and assembly of marine timber components is undertaken, including laminating by cold processes, Unit 25.5A (Construct and assemble marine vessel timber components should be selected). Where complex forming is required, Unit 9.21A (Interpret and produce curved 3-dimensional shapes) should also be considered.

Evidence guide**Assessment context**

This unit may be assessed on the job, off the job, or a combination of on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the construction of solid timber shapes using hot processes or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 25.10A A Perform fitout procedures

Band – Specialisation band A

Field – Marine vessel construction

Unit Weight 4

This unit covers the competencies required for structural fit-out of marine vessels. It includes set-out, construction, assembly and installation of a variety of components.

Straightforward installation of fittings/accessories is covered by Unit 18.2A (Use power tools/hand held operations).

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices

9.2A Interpret technical drawing

18.2A Use power tools/hand held operations

4.18A General woodworking machine operations

12.7A Mark off/out structural fabrications and shapes

25.5A Construct and assemble marine vessel timber components

9.1A Draw and interpret sketch

18.1A Use hand tools

Element 25.10A.1 Determine job requirements

Criteria 25.10A.1.1

Drawings are identified and checked for accuracy.
Accuracy and scale of drawings is checked.

Assessor guide: observe that –
Correct drawings are selected.
be given.

Assessor guide: confirm that –
Procedures used for drawing identification and accuracy can

Criteria 25.10A.1.2

Specified job requirements are identified from fit-out plans and procedures.

Assessor guide: observe that –
Job fixing methods, fit-out components, scantling sizes, patterns and materials are identified from fit-out plans and procedures. Work order identified in consultation with others, where appropriate.

Assessor guide: confirm that –
Common structures used in boat fit-out can be given. Job fixing methods, fit-out components, materials and use of patterns can be given.

Criteria 25.10A.1.3

Specified job requirements are identified.

Assessor guide: observe that –
Component structure, materials and assembly procedure are identified.

Assessor guide: confirm that –
Procedures used for constructing and assembling component can be given.

Element 25.10A.2 Construct fit-out components

Criteria 25.10A.2.1

Take-off quantities are checked and cutting list produced, if applicable.

Assessor guide: observe that –
Quantities are accurately determined and cutting list produced to requirements.

Assessor guide: confirm that –
Typical sizing, common species, strength and appearance requirements can be described.

Criteria 25.10A.2.2

Material is machined to suit job scantling sizes, strength and appearance requirements, where applicable.

Assessor guide: observe that –
Appropriate tools/equipment are selected and used.

Assessor guide: confirm that –
Practice used for machining of material can be given. Material characteristics in terms of species, strength, appearance grade can be described.

Criteria 25.10A.2.3

Materials are marked/cut out to specification

Assessor guide: observe that –

Appropriate tools/equipment are selected and used. Materials are marked out/cut to specifications, optimising appearance characteristics and minimising waste.

Assessor guide: confirm that –

Marking and cutting procedures can be given.

Criteria 25.10A.2.4

Components requiring assembly are clearly identified and the sequence of assembly determined.

Assessor guide: observe that –

Sequence of component assembly is correctly identified. Structure marked clearly for assembly.

Assessor guide: confirm that –

Practices used in identification and assembly sequence, of structure, can be given.

Element 25.10A.3 Assemble fit-out components**Criteria 25.10A.3.1**

Method of assembling and fastening components is identified.

Assessor guide: observe that –

Component assembly procedure and fastening application can be identified. Relevant fastening type/species are selected.

Assessor guide: confirm that –

Steps of assembly and method of fastening can be given. Appropriate tools are identified for fastening procedure.

Criteria 25.10A.3.2

Components are assembled to specifications.

Assessor guide: observe that –

Component assembly is checked against specifications for correct sizing and construction standard.

Assessor guide: confirm that –

Procedure used to check assembly specification can be given.

Criteria 25.10A.3.3

Waste materials are removed in accordance with workpractices and relevant legislation.

Assessor guide: observe that –

Clean up of excess waste material is applied using appropriate tools and solvent materials. Waste is disposed of in an environmentally sustainable manner in accordance with legislative requirements.

Assessor guide: confirm that –

Tools and solvent required for clean up practice can be identified. Safe work practices and personal protective equipment can be identified. Waste disposal obligations and regulations can be given.

Criteria 25.10A.3.4

Surface area of assembled components is sanded for installation, where applicable.

Assessor guide: observe that –

If applicable, selected component parts can be identified for sanding. Abrasive material selected to suit job requirements.

Assessor guide: confirm that –

Where applicable, identification of component parts requiring sanding and type of abrasive materials used can be given.

Criteria 25.10A.3.5

Component surface is pre-coated for preservation, where applicable, according to standard specification and procedure.

Assessor guide: observe that –

If applicable surface area is selected for preservation treatment. Appropriate coating material and application process selected.

Assessor guide: confirm that –

Surface preservation pre-coating and application method can be given.

Element 25.10A.4 Install components**Criteria 25.10A.4.1**

Surface area is marked for lay-out installation, where applicable.

Assessor guide: observe that –

Marking of installation lay out is performed correctly from given plans. Appropriate marking tools are selected and used.

Assessor guide: confirm that –

Where applicable, installation plan markings can be identified and transferred accordingly.

Criteria 25.10A.4.2 Fitting and levelling practices are applied.	<i>Assessor guide: observe that –</i> Component sections requiring alterations and levelling for installation are identified. Appropriate tools are selected for fitting/levelling practice.	<i>Assessor guide: confirm that –</i> Practices used for fitting and levelling can be given.
Criteria 25.10A.4.3 Fastenings are selected to suit job requirements.	<i>Assessor guide: observe that –</i> Correct fastening species and fastening type are selected.	<i>Assessor guide: confirm that –</i> Type of fastenings and material species can be given.
Criteria 25.10A.4.4 Components are fixed to meet specified job requirements.	<i>Assessor guide: observe that –</i> All structures are fixed in accordance with job specifications.	<i>Assessor guide: confirm that –</i> Method of fixing/fastening applications can be given.
Criteria 25.10A.4.5 Clean work practices are applied for coating and adhesive applications.	<i>Assessor guide: observe that –</i> All fit-out structures are prepared ready for coating and adhesive applications.	<i>Assessor guide: confirm that –</i> Materials can be identified for preparation (sanding).

Range statement

This unit covers the competencies required for structural fit-out of marine vessels. Set-out, construction, assembly and installation of flooring/decking, partitions, door frames, portlights, hatches, windows, windscreens, non-structural bulkheads, deckheads, bunks, cupboards and other furniture, lining, engine room, galley etc. Includes installation of thermal, noise, vibration and fire control insulation materials. Work may be undertaken autonomously or as part of a team. All work carried out safely and to specified industry standards for timber joinery, surface finish, appearance characteristics, dressing or plugging of fastenings, etc. All work and work practices are undertaken to regulatory and legislative requirements. Tasks should address both "on-the-job" and "pre-fabricated structure fit-outs". An arrangement of hand and hand held power tools and machinery may be used for construction and installation requirements. Materials used for fit-out may include, but not limited to, timber, composites, fibre-reinforced plastics, acrylics, polycarbonates, glass and metal. Where construction of fibre reinforced plastics components is undertaken, Unit 25.2 A (Form and integrate fibre-reinforced structures) should also be selected. Where construction of solid timber shapes using hot processes is undertaken, Unit 25.9A (Form timber shapes using hot processes) should also be selected. For straightforward installation of fittings/accessories, Unit 18.2A (Use power tools/hand held operations) should be selected. Where lines plan drawings and loftings are interpreted, Unit 9.21A (Interpret and produce curved 3-dimensional shapes) should also be considered.

Evidence guide**Assessment context**

This unit may be assessed on the job, off the job, or a combination of on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the construction, assembly and installation of fit-out components or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 25.11A A Install marine systems

Band – Specialisation band A

This unit covers the competencies required for the installation and testing of engine/plant and ancillary equipment relevant to propulsion, stability, steering and fuel systems for mechanically powered marine vessels. Where installation only is required, Unit 10.13A (Assemble and install equipment and accessories/ancillaries) should be selected.

Field – Marine vessel construction

Unit Weight 8

Pre-requisite units - Path 1

18.1A Use hand tools

18.2A Use power tools/hand held operations

Element 25.11A.1 Prepare installation site

Criteria 25.11A.1.1

Site features are checked using appropriate measuring equipment.

Assessor guide: observe that –

Relevant drawings, specifications and instructions are obtained in accordance with workplace procedures. The site is checked for correct location, dimensions and, where appropriate, levels in accordance with standard operating procedure.

Assessor guide: confirm that –

The different features to check can be identified. Equipment used to check various site features can be identified and their use given.

Criteria 25.11A.1.2

Non-compliance with specification is reported to appropriate authority.

Assessor guide: observe that –

Appropriate authority is identified and non-compliance reported in accordance with standard procedure.

Assessor guide: confirm that –

The procedure to be followed if the site features do not comply with specifications can be given. Appropriate authorities to which non-compliance need to be reported can be given. Procedures for checking machine/plant can be given.

Criteria 25.11A.1.3

Modifications are undertaken with approval of appropriate authority

Assessor guide: observe that –

Where appropriate, authorised alterations, corrections and/or adjustments are made to the site and/or machine/plant in accordance with standard procedures. Checks made to ensure approval has been received.

Assessor guide: confirm that –

Alterations, corrections and/or adjustments to be made to the site and/or machine/plant can be identified. Appropriate authorities to approve alterations, corrections and/or adjustments can be identified. Approval process can be given.

Criteria 25.11A.1.4

Installation site and components prepared.

Assessor guide: observe that –

Surfaces, materials and components are prepared for installation in accordance with specifications and standard procedures.

Assessor guide: confirm that –

The materials and components to be used in the installation of machine/plant can be given. Preparation requirements prior to commencing installation can be given.

Element 25.11A.2 Install marine engines/plant**Criteria 25.11A.2.1**

All work is carried out safely, in accordance with site procedures and relevant Australian Standards.

Assessor guide: observe that –

Work is carried out to applicable codes, standards, procedures. Safety measures are followed.

Assessor guide: confirm that –

Safety procedures and measures can be given. Applicable safety equipment and personal protective equipment can be identified and their use given. Relevant codes, standards can be given.

Criteria 25.11A.2.2

Engine/plant components are prepared for correct sequential installation.

Assessor guide: observe that –

Components are arranged to assist sequential installation procedures.

Assessor guide: confirm that –

The sequence in which components are to be installed can be given.

Criteria 25.11A.2.3

Engine/plant is installed in accordance with manufacturer's site specifications.

Assessor guide: observe that –

Components are installed and fixed correctly. Through hull and associated fittings are packed/sealed to maintain watertight integrity.

Assessor guide: confirm that –

Methods of fixing/fastening components can be given. Methods of lifting/moving, locating/holding components for fixing/fastening and the reasons for selecting specific methods can be given.

Criteria 25.11A.2.4

Engine/plant is checked for conformance to specifications and modifications/adjustments undertaken to standard operating procedure.

Assessor guide: observe that –

The machine/plant is checked for conformance to specifications. Where appropriate, approved obtained and adjustments are made in accordance with standard procedures and specifications.

Assessor guide: confirm that –

Procedures for checking machine/plant for conformance can be given. Non-conformance and reporting procedures can be given, including appropriate authority. Required adjustments can be given.

Criteria 25.11A.2.5

Engine/plant is installed in accordance with specifications.

Assessor guide: observe that –

Engine/plant is levelled, aligned, coupled and connected (excluding electrical connections) to specification. Where appropriate, electrical connections scheduled with appropriate persons.

Assessor guide: confirm that –

Levelling, alignment, coupling and connection requirements can be given. Person(s) for making electrical connections can be identified.

Criteria 25.11A.2.6

Site conditions finalised in accordance with OH & S requirements and standard procedures.

Assessor guide: observe that –

Installation site is cleared of all debris, waste, cleaned and left in a safe state. Waste is disposed of in an environmentally sustainable manner in accordance with legislative requirements.

Assessor guide: confirm that –

Cleaning and clearing requirements can be identified. Equipment for cleaning/clearing can be identified. Waste disposal obligations and regulations can be given.

Criteria 25.11A.2.7

Documentation completed to required specifications.

Assessor guide: observe that –

All reports and other documents are completed correctly and according to standard procedure.

Assessor guide: confirm that –

Reports and other documentation to be completed before, during and after installation can be given and required information outlined.

Element 25.11A.3 Test engine/plant systems and ancillary equipment**Criteria 25.11A.3.1**

Work/test requirements for engine/plant and ancillary equipment are identified.

Assessor guide: observe that –

Relevant data with respect to the operation of engine/plant and ancillary equipment is obtained. Appropriate test equipment is selected.

Assessor guide: confirm that –

Operational requirements/specifications of the engine/plant and ancillary equipment can be given. Test equipment is identified and the uses given.

Criteria 25.11A.3.2

Engine/plant and ancillary equipment is tested for correct operation.

Assessor guide: observe that –

Equipment is isolated in accordance with standard procedures. Engine/plant and ancillary equipment tested and correct operation verified. Non-conformances identified.

Assessor guide: confirm that –

Testing procedures and principles can be given. Reasons for selecting specific procedures and principles can be given.

Criteria 25.11A.3.3

Operational function is assessed and verified.

Assessor guide: observe that –

Variations between test results and operational specifications are identified. Assessment procedures are applied in accordance with safety and regulatory/site specifications. Operational function is verified in accordance with standard operating procedures. Equipment and techniques used/applied correctly.

Assessor guide: confirm that –

Normal operating characteristics of engine/plant and ancillary equipment can be given. Faults and malfunctions can be identified and reasons given.

Element 25.11A.4 Collect data and localise fault conditions**Criteria 25.11A.4.1**

Drawings/diagrams and operational specifications are used to identify and localise fault conditions.

Assessor guide: observe that –

Relevant drawings/diagrams and operational specifications are obtained and referred to.

Assessor guide: confirm that –

Fault conditions can be identified from drawings/diagrams and operational specifications.

Criteria 25.11A.4.2

Built-in fault indicators, error codes are examined and interpreted and results recorded to standard procedures.

Assessor guide: observe that –

Correct faults identified from built-in fault indicators, error codes.

Assessor guide: confirm that –

Error indications in built-in devices can be given.

Criteria 25.11A.4.3

Fault condition is localised to major component level.

Assessor guide: observe that –

Faults condition/s are identified using appropriate equipment.

Assessor guide: confirm that –

Methods of determining fault condition can be given.

Element 25.11A.5 Analyse and report test results**Criteria 25.11A.5.1**

Test results are analysed/verified against operational specifications and localised faults confirmed.

Assessor guide: observe that –

Test results are analysed against specifications for faults. Potential and actual faults are confirmed from comparison of test results to operational specifications.

Assessor guide: confirm that –

Criteria 25.11A.5.2

Potential and actual faults are reported according to standard procedures.

Assessor guide: observe that –

All relevant information is reported.

Assessor guide: confirm that –

Procedures for reporting faults can be identified. The difference between potential and actual faults can be given.

Criteria 25.11A.5.3

Corrective action is planned.

Assessor guide: observe that –

A plan to rectify the fault is developed.

Assessor guide: confirm that –

Probable causes/faults in engine/plant and ancillary equipment can be given. The appropriate action to rectify faults can be given.

Criteria 25.11A.5.4

Action plan is recorded/documented.

Assessor guide: observe that –

Planned corrective maintenance is recorded/documented according to standard procedures.

Assessor guide: confirm that –

Procedures for recording/documenting corrective maintenance activity are given.

Range statement

This unit applies to installation and testing practices of engine/plant and ancillary equipment relevant to propulsion, stability, steering and fuel systems for mechanically powered marine vessels. Work undertaken may include drive systems such as inboard/outboard, water jet and side thrusting units (excluding outboard motor installation). Stabilisers may include electric, hydraulic or mechanically operated fin and/or tab types. Steering systems may include hydraulic, cable and wire-operated units. Fuel systems may include petrol and diesel supply operations. Site locations may include new or existing external and internal locations for foundations, footings, beds and frameworks etc. completed prior to installation and commissioning. All specifications applied using engineering drawings, written and verbal instructions. Straightforward modifications are of a minor nature not requiring specification changes or technical recording. Testing should be undertaken in accordance with manufacturer specifications, guidelines, requirements and limitations. Testing procedures may include engineering practices for determining correct operational function of mechanical, fluid power systems, equipment, components and associated items. Extends to the use of mechanical, pneumatic/electro-pneumatic, electronic (analog/digital) and associated instruments, measuring variables such as temperature, pressure, flow rate, levels, lights, density or any other operational variable. Tasks may be undertaken in a workshop/site, moored or in a sea-trial situation. Work may be undertaken autonomously or as part of a team. All work and work practices undertaken to regulatory, legislative and manufacturer requirements. Where installation only is required, Unit 10.13A (Assemble and install equipment and accessories/ancillaries) should be selected. Where technical drawings are interpreted, Unit 9.2A (Interpret technical drawing) should also be considered. Where load shifting equipment such as ride on fork lifts/pallet trucks is used, Unit 11.10A (Operate mobile load shifting equipment) should also be considered. Where movable and fixed load shifting equipment, such as pendant cranes, travelling overhead cranes, monorail hoists and chain blocks etc. is used, Unit 11.22A (Operate fixed/moveable load shifting equipment) should also be considered.

Evidence guide**Assessment context**

This unit may be assessed on the job, off the job, or a combination of on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the installation and testing of engine/plant and ancillary equipment or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 25.12A A Install and test operations of marine auxiliary systems

Band – Specialisation band A

Field – Marine vessel construction

Unit Weight 6

This unit covers the competencies required for the installation and testing of marine auxiliary systems. Where installation only is required, Unit 10.13A (Assemble and install equipment and accessories/ancillaries) should be selected.

Pre-requisite units - Path 1

18.1A Use hand tools

18.2A Use power tools/hand held operations

18.3A Use tools for precision work

Element 25.12A.1 Determine job requirements

Criteria 25.12A.1.1

Job requirements established from plans, specifications, verbal instructions or visual inspections.

Assessor guide: observe that –

Structural assembly, lifting equipment, where applicable, installation plans/component are identified.

Assessor guide: confirm that –

Role of plans/specification used for installation of identified components can be given.

Criteria 25.12A.1.2

Installation materials are identified.

Assessor guide: observe that –

Material species such as metals, timber, resin and glass reinforcements are identified from plans/drawing.

Assessor guide: confirm that –

Species of materials and their uses can be given.

Criteria 25.12A.1.3

Compatibility of surface and fitting materials are identified.

Assessor guide: observe that –

Compatibility of component material and structural surface is established.

Assessor guide: confirm that –

Compatibility of between species/types of construction materials of component and surface can be given.

Criteria 25.12A.1.4

Installation site of system is identified.

Assessor guide: observe that –

Installation site is correctly identified from plans.

Assessor guide: confirm that –

Element 25.12A.2 Select Auxiliary System

Criteria 25.12A.2.1

Auxiliary system selected in accordance with job requirements.

Assessor guide: observe that –

Systems such as bilge, freshwater, plumbing are identified.

Assessor guide: confirm that –

Systems relevant to job task can be given. Sequence of installation can be given.

Criteria 25.12A.2.2

Material structure and installation procedures are identified.

Assessor guide: observe that –

Framework, footings, beds and system materials are identified. Sequence of installation is identified.

Assessor guide: confirm that –

Material species of structure/system and installation process can be given.

<p>Criteria 25.12A.2.3 Associated installation/assembly, plans/instruction are identified and verified.</p>	<p><i>Assessor guide: observe that –</i></p>	<p><i>Assessor guide: confirm that –</i> Plans/instruction relevant to installation and assembly of selected system can be given.</p>
<p>Element 25.12A.3 Install Auxiliary System</p>		
<p>Criteria 25.12A.3.1 Appropriate tools for specified installation are selected</p>	<p><i>Assessor guide: observe that –</i> Specific tools are selected.</p>	<p><i>Assessor guide: confirm that –</i> Tools, associated with system installation, can be identified and their uses given.</p>
<p>Criteria 25.12A.3.2 Where applicable, structural area cut to suit installation requirements.</p>	<p><i>Assessor guide: observe that –</i> In accordance with system to be installed, sections such as unit support/bracing etc requiring structural modification are identified. Appropriate tools are selected and used.</p>	<p><i>Assessor guide: confirm that –</i> Practices used in modifying structural components, to suit system applications can be given.</p>
<p>Criteria 25.12A.3.3 Where applicable, structural reinforcement fitted to suit job requirement.</p>	<p><i>Assessor guide: observe that –</i> Sections requiring structural reinforcement and materials used, such as foams, timber, fibre reinforced plastics, metal etc are identified.</p>	<p><i>Assessor guide: confirm that –</i> Procedures used in applying the reinforcement to structural sections can be given.</p>
<p>Criteria 25.12A.3.4 Structural area prepared for surface preparation.</p>	<p><i>Assessor guide: observe that –</i> Reinforced section requiring sanding, in accordance with job requirements, are identified. Abrasive material/sanding tools are selected.</p>	<p><i>Assessor guide: confirm that –</i> Method of sanding for surface preparation can be given.</p>
<p>Criteria 25.12A.3.5 Coating sealants and/or isolation materials are applied to suit job requirements.</p>	<p><i>Assessor guide: observe that –</i> Appropriate sealants, coatings/isolation materials, such as sika, paints, flowcoat, nylon etc are selected and applied in accordance with job requirements.</p>	<p><i>Assessor guide: confirm that –</i> Sealant coatings and/or isolation materials can be identified Application procedures can be given.</p>
<p>Criteria 25.12A.3.6 Fastening methods are applied to suit job application.</p>	<p><i>Assessor guide: observe that –</i> Appropriate fastening method and type/materials species can be selected. Appropriate tools are selected and used in accordance with job task.</p>	<p><i>Assessor guide: confirm that –</i> Practice used in fastening application can be given.</p>
<p>Criteria 25.12A.3.7 Installation procedures applied in accordance with job specification.</p>	<p><i>Assessor guide: observe that –</i> System is correctly installed in accordance with plans/verbal instruction. Where through hull and associated fittings are required, watertight integrity is maintained.</p>	<p><i>Assessor guide: confirm that –</i> System requirements and installation procedures are understood and can be explained.</p>

<p>Criteria 25.12A.3.8 Clean work practices are applied.</p>	<p><i>Assessor guide: observe that –</i> Waste materials such as resin, sealants etc. are removed in accordance with workplace quality procedure and disposed of in an environmentally sustainable manner in accordance with legislative requirements.</p>	<p><i>Assessor guide: confirm that –</i> Waste materials can be identified and removal practices given. Waste disposal obligations and regulations can be given.</p>
<p>Element 25.12A.4 Test Operation of Auxiliary System</p>		
<p>Criteria 25.12A.4.1 Pre-test checks are applied and verified before standard testing procedures.</p>	<p><i>Assessor guide: observe that –</i> Pre-test check list selected and verification made in accordance with job requirements.</p>	<p><i>Assessor guide: confirm that –</i> Standard pre-testing checks can be given.</p>
<p>Criteria 25.12A.4.2 Test operation procedures are identified and verified.</p>	<p><i>Assessor guide: observe that –</i> Testing procedures are identified from standard operational manual. Operation manual is verified against system identity.</p>	<p><i>Assessor guide: confirm that –</i></p>
<p>Criteria 25.12A.4.3 Where required, test equipment is correctly set-up and used in accordance with testing practice.</p>	<p><i>Assessor guide: observe that –</i> Appropriate test equipment is selected and set up correctly.</p>	<p><i>Assessor guide: confirm that –</i> Role, function and set-up procedure of test equipment can be given.</p>
<p>Criteria 25.12A.4.4 Systems tested in accordance with specified operational procedures.</p>	<p><i>Assessor guide: observe that –</i> Correct operation of system is verified.</p>	<p><i>Assessor guide: confirm that –</i> Practice used in testing operation of installed system can be given.</p>
<p>Criteria 25.12A.4.5 All faults are recorded and reported to appropriate authorities.</p>	<p><i>Assessor guide: observe that –</i> Where applicable, fault diagnosis is recorded and identified to appropriate personnel.</p>	<p><i>Assessor guide: confirm that –</i> Recording procedures for fault diagnosis and identification can be given.</p>
<p>Criteria 25.12A.4.6 Faults are rectified and re-tested for correct operation.</p>	<p><i>Assessor guide: observe that –</i> Diagnosed faults are rectified and re-testing procedures applied.</p>	<p><i>Assessor guide: confirm that –</i> Methods used for rectifying faults and re-testing of system operations can be given.</p>
<p>Criteria 25.12A.4.7 Final test operation recorded and documented according to standard operating procedures.</p>	<p><i>Assessor guide: observe that –</i> In accordance with system operation check list, final test approval is documented.</p>	<p><i>Assessor guide: confirm that –</i> Test operation check list can be identified and recording procedure for final test clearance given.</p>

Range statement

This unit applies to installation and testing practices of auxiliary systems for marine vessels. Work may be undertaken autonomously or as part of a team. Work may include the installation and testing operations of systems such as bilge, freshwater, fire (water) and sanitary plumbing systems. Lifting systems include davits, crane and winch units. Locations may include external and internal locations for foundations, footings, beds and frameworks etc completed prior to installation and commissioning. All specifications applied via engineering drawings, written or verbal instructions. Routine modifications and alterations are of a minor nature not requiring specification changes or technical recording. Testing should be undertaken in accordance with manufacturer specifications, guidelines, requirements and limitations. Testing procedures may include engineering practices for determining correct operational function of mechanical, fluid power systems, equipment, components and associated items. Extends to the use of mechanical, pneumatic/electro-pneumatic, electronic (analog/digital) and associated instruments, measuring variables such as temp, pressure, flow rate, levels, light, density or any other process variable. Tasks may be undertaken in a workshop/site, moored or in a sea trial situation. All work and work practices undertaken to regulatory and legislative requirements. Where installation only is required, Unit 10.13A (Assemble and install equipment and accessories/ancillaries) should be selected.

Evidence guide**Assessment context**

This unit should be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Assessment conditions

The candidate will have access to: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with installing and testing operations of marine auxiliary systems or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 25.13A A Produce three-dimensional plugs/moulds

Band – Specialisation band A

Field – Marine vessel construction

Unit Weight 12

This unit covers the competencies required for the manufacturing of three dimensional plugs and where applicable, solid and/or split moulds constructions used in marine vessel construction.

Note - This unit has dual status and is to be regarded as both a Specialisation band A unit and Specialisation band B unit for progression to C5 (AQF level V)

Pre-requisite units - Path 1

2.5C11 Measure with graduated devices

9.2A Interpret technical drawing

18.2A Use power tools/hand held operations

4.18A General woodworking machine operations

12.7A Mark off/out structural fabrications and shapes

25.2A Form and integrate fibre-reinforced structures

9.1A Draw and interpret sketch

18.1A Use hand tools

25.3A Set up marine vessel structures

Element 25.13A.1 Determine plug requirements

Criteria 25.13A.1.1

Plug specifications are established from drawings, relevant documentation and client discussion as appropriate.

Assessor guide: observe that –

Material dimensions and specified plug drawing are identified. Relevant drawing and material specifications can be given.

Assessor guide: confirm that –

Criteria 25.13A.1.2

Plug construction materials are selected in accordance with job requirements and specifications.

Assessor guide: observe that –

Materials, such as timber, plywood, fastenings, fillers etc are identified from specifications/drawings. In accordance with construction details, correct plug materials are selected.

Assessor guide: confirm that –

Plug construction materials can be given.

Criteria 25.13A.1.3

Plug coating materials are selected to meet specifications in accordance with organisational

Assessor guide: observe that –

Plug finishing coating materials such as single/two packs paints and their application procedures are identified. Dimensions relevant to plug components are marked out accurately.

Assessor guide: confirm that –

Plug coating materials can be given.

Criteria 25.13A.1.4

Appropriate tooling and machinery selected.

Assessor guide: observe that –

Hand tools, hand held power tools and workshop machinery are selected to suit plug construction.

Assessor guide: confirm that –

Hand tools, hand held power tools and workshop machinery can be identified and their uses given.

Element 25.13A.2 Construct plug

Criteria 25.13A.2.1

Plug material/s are accurately marked out in accordance with plug construction requirements.

Assessor guide: observe that –

Dimensions relevant to plug components are marked out accurately according to construction plan.

Assessor guide: confirm that –

Correct dimensions and application procedures for marking out can be given.

<p>Criteria 25.13A.2.2 Where applicable, plug release angles/taper, flanges and rounding/concaving of corners carried out.</p>	<p><i>Assessor guide: observe that –</i> Sections requiring release angles/tapers, flanges and rounding/concaving are identified and produced.</p>	<p><i>Assessor guide: confirm that –</i> Purpose of release angles/tapers, flanges, rounding/concaving of corner sections can be given.</p>
<p>Criteria 25.13A.2.3 Appropriate tools, machine/s and construction practices used to construct plug.</p>	<p><i>Assessor guide: observe that –</i> Hand tools/hand held power tools and workshop machinery are used correctly and safely in accordance with plug construction requirements.</p>	<p><i>Assessor guide: confirm that –</i> Appropriate hand tools/hand held power tools and workshop machinery can be identified and their uses given.</p>
<p>Element 25.13A.3 Finish plug</p>		
<p>Criteria 25.13A.3.1 Plug is checked for compliance with specifications/drawing.</p>	<p><i>Assessor guide: observe that –</i> Practices used to check external/internal dimensions against specification/drawings are applied. External/internal dimensions of plug aligns with plug specification /drawing.</p>	<p><i>Assessor guide: confirm that –</i></p>
<p>Criteria 25.13A.3.2 Where applicable, final finish coating/s applied to plug where required to comply with specifications.</p>	<p><i>Assessor guide: observe that –</i> If applicable, final finish coating/s and application sequence applied in accordance with job specifications.</p>	<p><i>Assessor guide: confirm that –</i> Method of application and sequence of final finish coating can be given.</p>
<p>Criteria 25.13A.3.3 Where applicable, plug prepared for mould manufacturing in accordance with specifications or standard operating procedures.</p>	<p><i>Assessor guide: observe that –</i> If applicable, sanding, buffing/polishing practices in preparing plug, for mould lay-up is carried out in accordance with workshop procedures.</p>	<p><i>Assessor guide: confirm that –</i> Procedures used for sanding/buffing/polishing of plug can be given.</p>
<p>Element 25.13A.4 Determine mould requirements</p>		
<p>Criteria 25.13A.4.1 Mould construction specifications and drawings interpreted.</p>	<p><i>Assessor guide: observe that –</i> Mould construction materials and lay-up sequence relevant to associated specification/drawing are identified.</p>	<p><i>Assessor guide: confirm that –</i> Mould materials and associated construction practices can be given.</p>
<p>Criteria 25.13A.4.2 Mould construction materials selected in accordance with specifications.</p>	<p><i>Assessor guide: observe that –</i> Mould construction/reinforcement materials such as matting, stiffening products are selected to suit job requirements.</p>	<p><i>Assessor guide: confirm that –</i> Mould construction materials can be given.</p>
<p>Criteria 25.13A.4.3 Appropriate tools and machinery/equipment selected for job application.</p>	<p><i>Assessor guide: observe that –</i> Correct hand tools, hand held power tools and workshop machinery/equipment are selected in accordance with job requirements.</p>	<p><i>Assessor guide: confirm that –</i> Tools, machinery/equipment required to construct mould can be identified and their uses explained.</p>

Element 25.13A.5 Produce mould**Criteria 25.13A.5.1**

Tooling coat is applied to plug in accordance with standard application procedures.

Assessor guide: observe that –

Tooling gelcoat is applied correctly, in accordance with workshop procedures and manufacturer's specification.

Assessor guide: confirm that –

Method of applying tooling gelcoat can be identified and use of equipment can be given.

Criteria 25.13A.5.2

Construction materials are applied to plug in accordance with appropriate lay-up sequence and procedure.

Assessor guide: observe that –

Lay-up sequence and procedure is followed correctly.

Assessor guide: confirm that –

For mould construction, method of material lay-up sequence and application procedure can be given.

Criteria 25.13A.5.3

Where applicable, apply stiffening/bracing materials in accordance with job requirements.

Assessor guide: observe that –

If applicable, sections requiring stiffening/bracing are identified and appropriate materials applied correctly.

Assessor guide: confirm that –

If applicable, methods used to apply stiffening/bracing materials can be given.

Criteria 25.13A.5.4

Where applicable, prepare mould for production run/s.

Assessor guide: observe that –

If applicable, practices used in preparing a new mould, for production runs are applied.

Assessor guide: confirm that –

Procedures used to prepare a new mould can be given.

Range statement

This unit covers the manufacture of three-dimensional plugs and, where applicable, solid and/or split mould constructions. Work may be undertaken autonomously or as part of a team. Predetermined standards of quality and safety are observed and work is carried out following standard operating procedures relevant to industry standards. Tasks may include the use of hand and mechanical lay-up practices for plug/mould construction. Materials used may include a variety of timber, metal, plastic, fibreglass composites, fillers etc. Hand tools/ power tools and workshop machinery/equipment can also be used in conjunction with construction practices. Where mark off/out skills are required then Unit 12.7A (Mark off/out structural fabrications and shapes) should also be selected.

Evidence guide**Assessment context**

Assessment may occur on the job or in a simulated workplace. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team.

The assessment environment should not disadvantage the candidate.

Assessment conditions

The candidate will be provided with:

- All tools, equipment, materials and documentation required.

The candidate will be permitted to refer to the following documents:

- Any relevant workplace procedures.

- Any relevant product and manufacturing specifications.

The candidate will be required to:

- Orally, or by other methods of communication, answer questions put by the assessor.

- Identify colleagues who can be approached for the collection of competency evidence where appropriate.

- Present evidence of credit for any off-job training related to this unit.

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Critical aspects

This unit is to be assessed in conjunction with a production machine or equipment. The unit could also be assessed in conjunction with units assessing the safety, quality, communication, materials handling, recording and reporting associated with producing three-dimensional plugs and moulds or other competencies requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Special notes

During assessment, the individual will:

- demonstrate safe working practises at all times,

- communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment:

- take responsibility for the quality of their own work:

- plan tasks in all situations and review task requirements as appropriate:

- perform all tasks in accordance with standard operating procedures:

- perform all tasks to specification;

- use accepted engineering techniques, practices, processes and workplace procedures.

Tasks involved will be completed within reasonable timeframes relating to typical workplace activities.

Unit MEM 25.14A A Perform marine slipping operations

Band – Specialisation band A

Field – Marine vessel construction

Unit Weight 2

This unit covers the competencies required for slipping a range of marine vessels such as work/pleasure craft, yachts etc. to suit capacity of slipping facility. It covers the

set up of slipping facilities, hauling out and launching of vessels using a range of methods to suit the slipping facility.

Pre-requisite units - Path 1

9.2A Interpret technical drawing

18.2A Use power tools/hand held operations

12.7A Mark off/out structural fabrications and shapes

18.1A Use hand tools

Element 25.14A.1 Set up slipping facilities

Criteria 25.14A.1.1

Set up of slipping facility is determined to suit vessel in accordance with organisational and legislative requirements.

Assessor guide: observe that –

Slipping set up takes into account mooring facility, slipping facility hull design, other applicable slipping requirements and required access.

Assessor guide: confirm that –

Common mooring facilities identified and slipping facilities and methods are explained. Hull designs can be related to slipping requirements. Safety and legislative requirements for slipping can be given.

Criteria 25.14A.1.2

Where applicable, measurements to suit hull structure are taken.

Assessor guide: observe that –

Measurements relevant to positioning of hull structure on slipping facilities are identified from plans/verbal instruction.

Assessor guide: confirm that –

Different types of hull structures can be given. Set up of slipping facility to suit hull/backbone structures can be given.

Criteria 25.14A.1.3

Where applicable, hull support bearers are safely positioned to suit hull structure.

Assessor guide: observe that –

Relevant support bearers requiring positioning, to suit backbone structure, and securing methods are identified.

Assessor guide: confirm that –

Techniques for positioning hull support bearers are outlined

Safety requirements in relation to setting up hull support

Element 25.14A.2 Perform hauling out procedures

Criteria 25.14A.2.1

Slipping facilities are positioned to suit slipping application.

Assessor guide: observe that –

Slipping facility is correctly positioned.

Assessor guide: confirm that –

The correct positioning of slipping facility to suit specified hull can be given.

Criteria 25.14A.2.2

Vessel is positioned to suit slipping set up.

Assessor guide: observe that –

Vessel is positioned correctly in accordance with set up of slipping facility.

Assessor guide: confirm that –

Correct vessel positioning can be given in relation to backbone/bearer support.

<p>Criteria 25.14A.2.3 Vessel retaining ropes are selected and secured correctly, in accordance with slipping facility and vessel retaining requirements.</p>	<p><i>Assessor guide: observe that –</i> Vessel retaining requirements and slipping facility arrangements are established. Appropriate vessel retaining ropes are selected. Ropes are handled and cleated/secured correctly.</p>	<p><i>Assessor guide: confirm that –</i> Appropriate vessel retaining ropes are identified and method of securing can be given. Types of knots are identified and purpose explained.</p>
<p>Criteria 25.14A.2.4 Vessel is grounded/levelled for positioning of hull support</p>	<p><i>Assessor guide: observe that –</i> Vessel is grounded/trimmed correctly to aid levelling of vessel for positioning of relevant hull supports.</p>	<p><i>Assessor guide: confirm that –</i> Procedures for grounding/levelling of vessel can be given.</p>
<p>Criteria 25.14A.2.5 Hull support mechanics are correctly positioned. can be identified and their uses can be given.</p>	<p><i>Assessor guide: observe that –</i> Arms, straps slings, etc. are positioned correctly.</p>	<p><i>Assessor guide: confirm that –</i> Different hull support mechanics such as arms, straps slings</p>
<p>Criteria 25.14A.2.6 Safety checks of vessel stability are carried out.</p>	<p><i>Assessor guide: observe that –</i> Appropriate safety checks to ensure vessel stability are applied.</p>	<p><i>Assessor guide: confirm that –</i> Safety checks relevant to stability of vessel, before extraction from water, can be given.</p>
<p>Element 25.14A.3 Perform launching procedures</p>		
<p>Criteria 25.14A.3.1 Vessel support and slip devices checked for safety.</p>	<p><i>Assessor guide: observe that –</i> Before launching, safety checks on vessel stability supports such as props, bearers, wedge, slings etc are carried out.</p>	<p><i>Assessor guide: confirm that –</i> Correct procedures used to check vessel stability before launching can be given.</p>
<p>Criteria 25.14A.3.2 Pre-launch safety checks for vessel seaworthiness are applied.</p>	<p><i>Assessor guide: observe that –</i> Safety checks on fittings relevant to water ingress are carried out.</p>	<p><i>Assessor guide: confirm that –</i> Pre-launch safety checks, such as bilge plug, water inlet valves, etc. can be given.</p>
<p>Criteria 25.14A.3.3 Launch practices are carried out according to standard procedure and organisational requirements.</p>	<p><i>Assessor guide: observe that –</i> Cradle retaining devices, such as chocks are released.</p>	<p><i>Assessor guide: confirm that –</i> Procedures used in the release of slipping facility can be given.</p>
<p>Criteria 25.14A.3.4 Hull support devices are re-positioned to prevent obstruction during vessel removal.</p>	<p><i>Assessor guide: observe that –</i> Hull supports such as arms, slings are positioned to allow clear passage for removal of vessel.</p>	<p><i>Assessor guide: confirm that –</i> Practice used in re-positioning of hull supports can be given.</p>

Criteria 25.14A.3.5

Where applicable, vessel is moored using appropriate restraints.

Assessor guide: observe that –

Vessel is moored in accordance with requirements of mooring facility Retaining ropes are belayed/secured correctly, and where necessary, appropriate knots are used.

Assessor guide: confirm that –

In accordance with mooring facility used, procedures applied to retaining of vessel can be given. Advantages of various securing methods can be explained.

Range statement

This unit covers the competencies required for slipping a range of marine vessels such as work/pleasure craft, yachts etc. to suit capacity of slipping facility. It covers the preparation of slipping facilities, hauling out and launching of vessels using a range of methods appropriate to the slipping facility. Hull support devices may include slings, shoring, cables, stays, blocks, chocks etc. Work is undertaken in a team environment. Predetermined standards of quality and safety are observed and work is carried out following standard operational procedures. All work and work practices are undertaken to regulatory and legislative requirements. Where boat is to be moored using the vessel's engine or with the assistance of a work boat, Unit 50.9A (Safely operate a mechanically powered recreational boat) should be selected. Where travel lifts, forklifts and/or cranes are used, Unit 11.10A (Operate mobile load shifting equipment) or other appropriate units should also be selected.

Evidence guide**Assessment context**

This unit may be assessed on the job, off the job, or a combination of on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. - Any relevant codes, standards, manuals and reference materials. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Critical aspects

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with slipping operations or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted engineering techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

Unit MEM 50.1E A Classify recreational boating technologies and features

Band – Boating Services

Field – Boating services

This unit covers the competencies required to recognise vessel features, fittings and fixtures, to correctly identify power and transmission systems, describe system operating purpose and use appropriate terminology

Element 50.1E.1 Identify vessel configurations used in boating applications

Criteria 50.1E.1.0

Assessor guide: observe that –

Assessor guide: confirm that –

Criteria 50.1E.1.1

Hull forms and superstructure features are identified

Assessor guide: observe that –

Hull and superstructure designs are identified on vessels and in catalogues, diagrams and plans

Assessor guide: confirm that –

The candidate identifies the likely applications of hull and superstructure design configurations

Criteria 50.1E.1.2

Hull designs are matched to normal vessel application

Assessor guide: observe that –

Hulls are classified as planing or displacement type

Assessor guide: confirm that –

Criteria 50.1E.1.3

Construction materials are identified

Assessor guide: observe that –

Assessor guide: confirm that –

The candidate identifies construction materials and their characteristics

Appropriate marine terminology is used in describing vessels, including: starboard, port, fore, aft, stern, bow, quarter, transom, skeg, keel, tiller, chine, stem, bow rail, hull, freeboard, gunwale, deck

Element 50.1E.2 Identify and describe the functions of the major systems of a recreational vessel and trailer.

Criteria 50.1E.2.1

Systems used for vessel propulsion, steering, navigation, communication, services and appliances are identified and functions are explained

Assessor guide: observe that –

Solar, wind, hydraulic, mechanical, electrical and fuelled systems are located and identified on vessels and in diagrams and plans

Assessor guide: confirm that –

Function of the system described matches the system operating principles and application

The candidate identifies the propulsion system's key components

<p>Criteria 50.1E.2.2 Trailer components including winching, coupling, load securing, braking, suspension and electrical systems are identified and functions are explained</p>	<p><i>Assessor guide: observe that –</i></p>	<p><i>Assessor guide: confirm that –</i> Corrosion/electrolysis and cavitation control methods are identified</p>
Element 50.1E.3 Identify fasteners and fittings used in recreational boating applications		
<p>Criteria 50.1E.3.1 Fasteners used for attaching components and systems to the vessel are identified, explaining the reasons for the materials selection and maintenance requirements</p>	<p><i>Assessor guide: observe that –</i> Fasteners and fittings are located and identified on components, vessels and in catalogues, diagrams and plans</p>	<p><i>Assessor guide: confirm that –</i> Function of the fasteners and fittings described matches the application</p>
<p>Criteria 50.1E.3.2 Fittings are identified and categorised for function and application</p>	<p><i>Assessor guide: observe that –</i></p>	<p><i>Assessor guide: confirm that –</i> The candidate identifies the likely application of fasteners and fittings</p>
<p>Criteria 50.1E.3.3 Replacement and/or repair fasteners are identified and matched to applications</p>	<p><i>Assessor guide: observe that –</i></p>	<p><i>Assessor guide: confirm that –</i> The candidate identifies the likely application of fasteners and fittings</p>
Element 50.1E.4 Use identification information to confirm vessel origins		
<p>Criteria 50.1E.4.1 Vessel identification plates and registration tags are located</p>	<p><i>Assessor guide: observe that –</i> Identification tags and labels are located and used with relevant technical information</p>	<p><i>Assessor guide: confirm that –</i> Information is interpreted and recorded accurately</p>
<p>Criteria 50.1E.4.2 Engine number, model designation and other details are located and recorded</p>	<p><i>Assessor guide: observe that –</i> Identification tags and labels are located and used with relevant technical information</p>	<p><i>Assessor guide: confirm that –</i> Information is interpreted and recorded accurately</p>
<p>Criteria 50.1E.4.3 Identification data is used to confirm vessel year of manufacture, refurbishment (and/or registration)</p>	<p><i>Assessor guide: observe that –</i> Identification tags and labels are located and used with relevant technical information</p>	<p><i>Assessor guide: confirm that –</i> Information is interpreted and recorded accurately</p>

Element 50.1E.5 Identify configuration of motorised propulsion systems**Criteria 50.1E.5.1**

Vessel power plant(s) are located and categorised for fuel system, number and configuration of cylinders

Assessor guide: observe that –

Power plants, propulsion systems and fittings are located and identified on vessels and in catalogues and diagrams

Assessor guide: confirm that –

Power plants, propulsion systems and fittings are categorised and identified to match the examples shown
Terminology for the operational descriptions include appropriate use of the terms and measurements for area, volume, pressure, ratio, power ratings, bore, stroke, capacity

Criteria 50.1E.5.2

Engine cooling and control systems are identified and categorised

Assessor guide: observe that –

Power plants, propulsion systems and fittings are located and identified on vessels and in catalogues and diagrams

Assessor guide: confirm that –

Power plants, propulsion systems and fittings are categorised and identified to match the examples shown
Terminology for the operational descriptions include appropriate use of the terms and measurements for area, volume, pressure, ratio, power ratings, bore, stroke, capacity

Criteria 50.1E.5.3

Engine lubricating systems are identified and categorised

Assessor guide: observe that –

Power plants, propulsion systems and fittings are located and identified on vessels and in catalogues and diagrams

Assessor guide: confirm that –

Power plants, propulsion systems and fittings are categorised and identified to match the examples shown
Terminology for the operational descriptions include appropriate use of the terms and measurements for area, volume, pressure, ratio, power ratings, bore, stroke, capacity

Criteria 50.1E.5.4

Vessel propulsion (transmission) system is categorised for type and operation

Assessor guide: observe that –

Power plants, propulsion systems and fittings are located and identified on vessels and in catalogues and diagrams

Assessor guide: confirm that –

Power plants, propulsion systems and fittings are categorised and identified to match the examples shown
Terminology for the operational descriptions include appropriate use of the terms and measurements for area, volume, pressure, ratio, power ratings, bore, stroke, capacity

Criteria 50.1E.5.5

Operating cycles and cylinder configuration for 2 stroke, 4 stroke, diesel and petrol powered engines are described

Assessor guide: observe that –

Power plants, propulsion systems and fittings are located and identified on vessels and in catalogues and diagrams

Assessor guide: confirm that –

Power plants, propulsion systems and fittings are categorised and identified to match the examples shown
Terminology for the operational descriptions include appropriate use of the terms and measurements for area, volume, pressure, ratio, power ratings, bore, stroke, capacity

Range statement

This unit may be applied in a workplace in which vessels are repaired in or out of water.

Descriptions of engine operation should include:

- Identification of valve and port types, fuel delivery method (diesel, fuel injection and carburetted), ignition method, cooling and lubrication system type,
- Description of cycle sequence and operational timing
- Propulsion systems include sail, outboard and inboard/outboard drives, jet drives

Evidence guide**Assessment context**

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Critical aspects

This unit could be assessed in conjunction with any other units addressing safety, industrial chemicals, communication, materials handling and units associated with working within the recreational boating environment, or other units requiring the exercise of the skills and knowledge covered by this unit.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. - All safety clothing and personal safety equipment. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted industry techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities.

Unit MEM 50.2A A Work safely on marine craft

Band – Specialisation band A

Field – Boating services

Unit Weight 1

This Unit covers the competencies required to identify risks and to safely work on and move around vessels for sales, service or repair, on and out of the water. The unit

may be applied to recreational vessels in both land and water environments.

Element 50.2A.1 Identify safe access methods and working platforms

Criteria 50.2A.1.1

Appropriate access methods are used to gain access to the work location

Assessor guide: observe that –

Workplace required procedures are followed including any required fall protection.

Assessor guide: confirm that –

Workplace procedures are able to be interpreted and the reasons for the requirements explained.

Criteria 50.2A.1.2

Work platforms are inspected to confirm that they are appropriate for the purpose, are correctly located and comply with any regulatory controls

Assessor guide: observe that –

Correct platforms, scaffolding and related access equipment are selected and located according to workplace procedures and regulatory provisions

Assessor guide: confirm that –

Workplace procedures are able to be interpreted and the reasons for the requirements explained.

Element 50.2A.2 Move around vessels safely

Criteria 50.2A.2.1

Risks and hazards are identified from observation and workplace approved risk controls are identified

Assessor guide: observe that –

Appropriate risk control measures are used

Assessor guide: confirm that –

The hazards when working on vessels in the water and on land can be identified, including: moorings, cables and winches, slings and pulleys, anchors, trailerable vessels, cranes, gantries, jacks, dollies and props, forklifts, fuel storage, flammable gas storage and ventilation systems

Criteria 50.2A.2.2

2.2 Appropriate engineering controls and personal protection equipment for work with recreational vessels are used

Assessor guide: observe that –

Appropriate risk control measures are used

Assessor guide: confirm that –

Appropriate workplace procedures and precautions can be matched to the hazards.

Criteria 50.2A.2.3

Appropriate warning signs and signals are used

Assessor guide: observe that –

Appropriate risk control measures are used

Assessor guide: confirm that –

Appropriate workplace procedures and precautions can be matched to the hazards

Element 50.2A.3 Work safely on recreational vessels**Criteria 50.2A.3.1**

Work methods and tools are selected appropriate for the task

Assessor guide: observe that –

The work methods and controls are appropriate for the task and work environment and follow workplace procedures

Assessor guide: confirm that –

The hazards when working on vessels in the water and on land can be identified, including:

Noise

Confined spaces

Working at heights/falls

Manual handling

Hazardous Substances, liquids/dust/fumes

Dangerous goods including fuels

Electrical installations and equipment

Gas and liquid fuelled appliances

Criteria 50.2A.3.2

Appropriate engineering controls and personal protection equipment are identified from workplace procedures, selected and used

Assessor guide: observe that –

Equipment is checked by candidates for working condition (and for current dates, labels or tags if required by regulation/codes)

Assessor guide: confirm that –

Appropriate workplace procedures and precautions can be matched to the hazards.

Criteria 50.2A.3.3

Work residues are minimised, controlled and disposed of following approved procedures

Assessor guide: observe that –

The work methods and controls are appropriate for the task and work environment and follow workplace procedures

Assessor guide: confirm that –

Appropriate workplace procedures and precautions can be matched to the hazards

Criteria 50.2A.3.4

3.4 Work site is maintained in a clean and tidy state, following approved workplace housekeeping methods

Assessor guide: observe that –

The work methods and controls are appropriate for the task and work environment and follow workplace procedures

Assessor guide: confirm that –

Appropriate workplace procedures and precautions can be matched to the hazards.

Element 50.2A.4 Follow emergency procedures for incidents in the marine environment**Criteria 50.2A.4.1**

Appropriate responses are used in reaction to incidents and accidents

Assessor guide: observe that –

Procedures are followed promptly and accurately and in accordance with workplace policy and regulatory requirements

Assessor guide: confirm that –

Organisations and/or personnel who may offer emergency assistance are able to be identified, including contact protocols

Criteria 50.2A.4.2

Communication systems and methods are used to convey emergency messages

Assessor guide: observe that –

Procedures are followed promptly and accurately and in accordance with workplace policy and regulatory requirements

Assessor guide: confirm that –

Effective communication of the nature and location of the emergency is made

Criteria 50.2A.4.3

Drills for fire, explosion, toxic/dangerous spills and leakage, personal illness or injury, man overboard, collision or vessel damage are followed

Assessor guide: observe that –

Procedures are followed promptly and accurately and in accordance with workplace policy and regulatory requirements

Assessor guide: confirm that –

Range statement

This unit may be applied in a workplace in which vessels are repaired in or out of water involving the use of dangerous goods and hazardous materials, noxious waste products etc. Personal protection can include goggles, masks, air helmets, head/hearing protection, fall arrest devices, U.V. protection, safety boots and appropriate work wear.

This unit describes the competencies that are particular to the marine environment.

This unit describes the competencies which are beyond those safety requirements normally applied in the workplace as described in Unit MEM 1.2F (Apply principles of Occupational Health & Safety (OH&S) in work environment) or specifically described in individual units such as Welding. The unit MEM 13.3A “Work Safely with industrial chemicals and materials” may be assessed with this unit

Work platforms include purpose built, mobile and pre-fabricated scaffold and elevated work platforms.

Access to work areas may include gang planks, access ladders, bosun’s chairs, rigging

Emergency communication systems include voice, flares, radio, hand signals, telephone, flags, computer, EPERB

Engineering controls include ventilation and extraction systems, dust control devices, screens

Housekeeping procedures include returning materials and equipment to appropriate storage, sweeping, containment and mopping of spills and appropriate disposal of waste products

Evidence guide**Assessment context**

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. - All safety clothing and personal safety equipment. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Critical aspects

This unit could be assessed in conjunction with any other units addressing safety, industrial chemicals, communication, materials handling and units associated with working within the recreational boating environment, or other units requiring the exercise of the skills and knowledge covered by this unit.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted industry techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities.

Unit MEM 50.3A A Follow work procedures to maintain the marine environment

Band – Specialisation band A

Field – Boating services

Unit Weight 1

This unit covers the competencies required to conduct work on vessels without adversely affecting the quality of the marine environment

Element 50.3A.1 Identify from work procedures and personal observation activities that may impact on the

Criteria 50.3A.1.1

Workplace environment and health and safety procedures are located and used to identify approved work procedures

Assessor guide: observe that –

Procedures to deal with hazardous substances, spills, waste management, noise, air and water quality are identified, including: drains, spill containment equipment and clean up materials

Assessor guide: confirm that –

The candidate can relate the requirements of approved work procedures to environmental regulations
Work activities which may cause air, water, land, noise or visual pollution are identified

Criteria 50.3A.1.2

Workplace is observed noting:
- location of drains and interceptors, bunded work and storage areas, recyclable, solid and hazardous waste storage, emergency equipment and spill kits
- areas where work may impact on the environment
- equipment and practices used to minimise environmental damage and legally dispose of waste

Assessor guide: observe that –

Procedures to deal with hazardous substances, spills, waste management, noise, air and water quality are identified, including: drains, spill containment equipment and clean up materials

Assessor guide: confirm that –

The candidate can relate the requirements of approved work procedures to environmental regulations
Work activities which may cause air, water, land, noise or visual pollution are identified

Element 50.3A.2 Complete assigned housekeeping duties

Criteria 50.3A.2.1

Assigned housekeeping duties are completed following workplace procedures ensuring that:
- waste is correctly removed to appropriate location
- any damaged equipment is tagged for maintenance and notified to appropriate personnel
- schedules and records for housekeeping duties are maintained

Assessor guide: observe that –

The candidate self checks that work areas meet required standards

Assessor guide: confirm that –

The candidate can identify why waste must be classified, collected and disposed of in appropriate storage areas

Criteria 50.3A.2.2

Housekeeping duties are carried out following workplace approved safe work practices and procedures

Assessor guide: observe that –

Equipment and consumables are selected in accordance with the housekeeping task and workplace procedures

Assessor guide: confirm that –

Candidate can identify the benefits to the business and the environment of waste reduction, reuse of materials, recycling and legal disposal of other waste generated

Element 50.3A.3 Follow spill clean up procedures**Criteria 50.3A.3.1**

Source of spill is identified and stopped if possible and notification made to appropriate personnel

Assessor guide: observe that –

Work procedures are followed
 Work activities are prioritised to prevent spread of spills into the environment
 Waste is classified, collected and disposed of in appropriate storage areas

Assessor guide: confirm that –

The candidate matches appropriate spill containment and clean up method and materials to the type of spill

Criteria 50.3A.3.2

2 Appropriate materials are identified to contain spills including: booms, portable bunding, absorbent materials and drain blocks

Assessor guide: observe that –

Work procedures are followed
 Work activities are prioritised to prevent spread of spills into the environment
 Waste is classified, collected and disposed of in appropriate storage areas

Assessor guide: confirm that –

The candidate matches appropriate spill containment and clean up method and materials to the type of spill

Criteria 50.3A.3.3

Spills are cleaned up following workplace procedures

Assessor guide: observe that –

Work procedures are followed
 Work activities are prioritised to prevent spread of spills into the environment
 Waste is classified, collected and disposed of in appropriate storage areas

Assessor guide: confirm that –

The candidate matches appropriate spill containment and clean up method and materials to the type of spill

Criteria 50.3A.3.4

Waste is disposed of in appropriate locations and containers

Assessor guide: observe that –

Work procedures are followed
 Work activities are prioritised to prevent spread of spills into the environment
 Waste is classified, collected and disposed of in appropriate storage areas

Assessor guide: confirm that –

The candidate matches appropriate spill containment and clean up method and materials to the type of spill

Element 50.3A.4 Assist the business to maintain the quality of the environment**Criteria 50.3A.4.1**

Business environment policy is followed

Assessor guide: observe that –

Noise suppression devices are used on equipment such as compressors
 Environment policy is followed
 Dust control and waste containment systems are used for sanding, grinding, shaping, chipping operations

Assessor guide: confirm that –

The candidate can relate the requirements of approved work procedures to environmental regulations
 Approved procedures for work activities which may cause air, water, land, noise or visual pollution are identified

Criteria 50.3A.4.2

Excessive idling and revving of engines is avoided compressors

Assessor guide: observe that –

Noise suppression devices are used on equipment such as work procedures to environmental regulations
Environment policy is followed
Dust control and waste containment systems are used for sanding, grinding, shaping, chipping operations

Assessor guide: confirm that –

The candidate can relate the requirements of approved

Approved procedures for work activities which may cause air, water, land, noise or visual pollution are identified

Criteria 50.3A.4.3

Noisy activities are located away from neighbours where possible

Assessor guide: observe that –

Noise suppression devices are used on equipment such as compressors
Environment policy is followed
Dust control and waste containment systems are used for sanding, grinding, shaping, chipping operations

Assessor guide: confirm that –

The candidate can relate the requirements of approved

work procedures to environmental regulations
Approved procedures for work activities which may cause air, water, land, noise or visual pollution are identified

Criteria 50.3A.4.4

Noise suppression procedures are used where available

Assessor guide: observe that –

Noise suppression devices are used on equipment such as compressors
Environment policy is followed
Dust control and waste containment systems are used for sanding, grinding, shaping, chipping operations

Assessor guide: confirm that –

The candidate can relate the requirements of approved

work procedures to environmental regulations
Approved procedures for work activities which may cause air, water, land, noise or visual pollution are identified

Criteria 50.3A.4.5

Dust control and waste containment measures are used

Assessor guide: observe that –

Noise suppression devices are used on equipment such as compressors
Environment policy is followed
Dust control and waste containment systems are used for sanding, grinding, shaping, chipping operations

Assessor guide: confirm that –

The candidate can relate the requirements of approved

work procedures to environmental regulations
Approved procedures for work activities which may cause air, water, land, noise or visual pollution are identified

Criteria 50.3A.4.6

Waste is appropriately collected and disposed of compressors

Assessor guide: observe that –

Noise suppression devices are used on equipment such as work procedures to environmental regulations
Environment policy is followed
Dust control and waste containment systems are used for sanding, grinding, shaping, chipping operations

Assessor guide: confirm that –

The candidate can relate the requirements of approved

Approved procedures for work activities which may cause air, water, land, noise or visual pollution are identified

Range statement

This unit may be applied in a workplace in which vessels are constructed, repaired or maintained in the marine environment, or in close proximity to the marine environment, involving the use of dangerous goods and hazardous materials, noxious waste products etc. Personal protection includes goggles, masks, air helmets, head/hearing protection, fall arrest devices, U.V. protection, safety boots and appropriate work wear. The level of 'classification' of waste and pollutants required in this unit is limited to grouping by known material (for example fuels and oils, dust, paint products, fouled water, solvents etc). The range of this unit does not extend to specific identification or chemical analysis of waste products and pollutants.

This unit describes the competencies that are particular to the marine environment.

Engineering controls include ventilation and extraction systems, dust control devices, screens

Housekeeping procedures include returning materials and equipment to appropriate storage, sweeping, containment and mopping of spills and appropriate disposal of waste

Evidence guide**Assessment context**

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. - All safety clothing and personal safety equipment. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Critical aspects

This unit could be assessed in conjunction with any other units addressing safety, industrial chemicals, communication, materials handling and units associated with working within the recreational boating environment, or other units requiring the exercise of the skills and knowledge covered by this unit.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted industry techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities.

Unit MEM 50.4A A Maintain quality of environment by following marina codes

Band – Specialisation band A

Field – Boating services

Unit Weight 1

The purpose of this unit is to assist workers in the industry in the control of pollution through the limitation, capture and disposal of pollutants in the marine environment.

Pre-requisite units - Path 1

50.3A Follow work procedures to maintain the marine environment

Element 50.4A.1 Assess the environmental implications of the tasks to be conducted

Criteria 50.4A.1.1

Tasks to be conducted are listed or work instructions consulted to establish work requirements

Assessor guide: observe that –

Work requirements and vessel are assessed for potential pollutants

Assessor guide: confirm that –

The candidate can identify surface coatings, fittings and finishes, work methods, equipment and materials used and the by-products of the work.

Criteria 50.4A.1.2

Vessel to be maintained is visually inspected to establish any particular potential pollutants

Assessor guide: observe that –

Work requirements and vessel are assessed for potential pollutants

Assessor guide: confirm that –

The candidate can identify surface coatings, fittings and finishes, work methods, equipment and materials used and the by-products of the work.

Criteria 50.4A.1.3

Potential pollutants that may be produced as a result of the work are identified

Assessor guide: observe that –

Work requirements and vessel are assessed for potential pollutants

Assessor guide: confirm that –

The candidate can identify surface coatings, fittings and finishes, work methods, equipment and materials used and the by-products of the work.

Element 50.4A.2 Select work area and method

Criteria 50.4A.2.1

Possible work areas are identified for the work and selected to:

-conform with marina/slipway codes and local environmental regulations

- minimise risk of pollution

Assessor guide: observe that –

Work space selected provides the most effective pollution control available in the marina/slipway

Assessor guide: confirm that –

The candidate matches regulatory requirements with the work area

Implications for the environment of the work are able to be explained

Impact on the business of non-compliance are explained

Criteria 50.4A.2.2

Work method, equipment and materials are selected to minimise impact on the environment

Assessor guide: observe that –

Work space selected provides the most effective pollution control available in the marina/slipway

Assessor guide: confirm that –

The candidate matches regulatory requirements with the work area
Implications for the environment of the work are able to be explained
Impact on the business of non-compliance are explained

Criteria 50.4A.2.3

Pollution control measures are identified and implemented

Assessor guide: observe that –

Work space selected provides the most effective pollution control available in the marina/slipway

Assessor guide: confirm that –

The candidate matches regulatory requirements with the work area
Implications for the environment of the work are able to be explained
Impact on the business of non-compliance are explained

Element 50.4A.3 Dispose of potential pollutants**Criteria 50.4A.3.1**

Potential pollutants are classified, separated and collected appropriate for the recycling, treatment or storage system adopted by the business

Assessor guide: observe that –

Potential pollutants are disposed of according to regulatory requirements

Assessor guide: confirm that –

Regulatory requirements for waste are applied consistently

Criteria 50.4A.3.2

Collected pollutants are disposed of in accordance with regulatory requirements and workplace procedures

Assessor guide: observe that –

Potential pollutants are disposed of according to regulatory requirements

Assessor guide: confirm that –

Regulatory requirements for waste are applied consistently

Element 50.4A.4 Support implementation of marina and slipway environment management plans**Criteria 50.4A.4.1**

Workplace designated procedures for marina and slipway management are followed

Assessor guide: observe that –

Management plan requirements are followed

Assessor guide: confirm that –

The candidate can relate the implications of the marina code to the operation of the business and personal job role

Links between Marina codes/best management practice documentation and workplace procedures can be made. Business marina and slipway environment management plan requirements can be explained.

Criteria 50.4A.4.2

Observations of management plan effects and possible implementation improvements are identified and communicated to appropriate personnel

Assessor guide: observe that –

Management plan requirements are followed

Assessor guide: confirm that –

The candidate can relate the implications of the marina code to the operation of the business and personal job role

Links between Marina codes/best management practice documentation and workplace procedures can be made. Business marina and slipway environment management plan requirements can be explained.

Criteria 50.4A.4.3

Active, positive involvement in implementation of the environment management plan is consistently applied

Assessor guide: observe that –

Management plan requirements are followed

Assessor guide: confirm that –

The candidate can relate the implications of the marina code to the operation of the business and personal job role

Links between Marina codes/best management practice documentation and workplace procedures can be made. Business marina and slipway environment management plan requirements can be explained.

Range statement

This unit may be applied to operations in marinas and slipways, inland and coastal, public and private.

Marinas are defined as the buildings, wharves and surroundings in which vessels are stored and maintained. Slipways are defined as the areas where vessels are removed from the water for repair or maintenance.

Waste water includes all process water, cleaning water, contaminated storm water, bilge water, black/grey water and other waste to be accepted in pump-out stations.

Sources of pollution of waters and contamination of sediment from marina and slipway activities include paint, anti-fouling, (flakes or soluble), sand or grit from blasting operations, fuel or oil spills, discharges of emulsified oil, fumes and overspray from painting operations, domestic waste.

Some of these pollutants are contaminants such as heavy metals, solvents, hydrocarbons, and other toxicants.

Evidence guide**Assessment context**

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. - All safety clothing and personal safety equipment. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Critical aspects

This unit could be assessed in conjunction with any other units addressing safety, industrial chemicals and units associated with working within the recreational boating environment, or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all pre-requisites have been satisfied.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted industry techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities.

Unit MEM 50.5E A Refuel vessels

Band – Boating Services

Field – Boating services

Unit Weight 0

This unit covers the competencies required to refuel vessels and appliances

Pre-requisite units - Path 1

50.2A Work safely on marine craft

50.3A Follow work procedures to maintain the marine environment

Element 50.5E.1 Match fuels and additives to marine applications

Criteria 50.5E.1.1

Fuels are selected to match the engine or appliance

Assessor guide: observe that –

Correct fuel types and grades are selected for the engine type, operating cycle, year of manufacture, appliance brand/type

Assessor guide: confirm that –

Specifications are consulted to confirm fuel requirement for the engine/appliance
The candidate identifies correct fuel type (diesel, leaded/unleaded petrol), lubricant and additives to match the application

Criteria 50.5E.1.2

Alternative fuel applications are considered

Assessor guide: observe that –

Correct fuel types and grades are selected for the engine type, operating cycle, year of manufacture, appliance brand/type

Assessor guide: confirm that –

Specifications are consulted to confirm fuel requirement for the engine/appliance
The candidate identifies correct fuel type (diesel, leaded/unleaded petrol), lubricant and additives to match the application

Criteria 50.5E.1.3

Fuel additives and lubricants are selected based on vessel/appliance use and manufacturer's requirements

Assessor guide: observe that –

Correct fuel types and grades are selected for the engine type, operating cycle, year of manufacture, appliance brand/type

Assessor guide: confirm that –

Specifications are consulted to confirm fuel requirement for the engine/appliance
The candidate identifies correct fuel type (diesel, leaded/unleaded petrol), lubricant and additives to match the application

Element 50.5E.2

Criteria 50.5E.2.1

Personal protection for contact with fuels is identified

Assessor guide: observe that –

The candidate identifies the risks and control measures applicable to each fuel type from workplace information

Assessor guide: confirm that –

The candidate can relate the requirements of approved safe work procedures to environmental regulation and public and personal safety

Criteria 50.5E.2.2

Dangers of volatile fuel liquids and vapours are identified

Assessor guide: observe that –

The candidate identifies the risks and control measures applicable to each fuel type from workplace information

Assessor guide: confirm that –

The candidate can relate the requirements of approved safe work procedures to environmental regulation and public and personal safety

Criteria 50.5E.2.3 Precautions for minimising risks associated with volatile liquids are identified in workplace procedures	<i>Assessor guide: observe that –</i> The candidate identifies the risks and control measures applicable to each fuel type from workplace information	<i>Assessor guide: confirm that –</i> The candidate can relate the requirements of approved safe work procedures to environmental regulation and public and personal safety
Criteria 50.5E.2.4 Procedures to prevent build up of volatile vapours and gases are identified	<i>Assessor guide: observe that –</i> The candidate identifies the risks and control measures applicable to each fuel type from workplace information	<i>Assessor guide: confirm that –</i> The candidate can relate the requirements of approved safe work procedures to environmental regulation and public and personal safety
Criteria 50.5E.2.5 Regulatory requirements for refilling portable fuel containers are identified	<i>Assessor guide: observe that –</i> The candidate identifies the risks and control measures applicable to each fuel type from workplace information	<i>Assessor guide: confirm that –</i> The candidate can relate the requirements of approved safe work procedures to environmental regulation and public and personal safety
Element 50.5E.3 Identify safety and environmental requirements for fuel refill areas		
Criteria 50.5E.3.1 Correct locations for refuelling activities are used	<i>Assessor guide: observe that –</i> The candidate identifies the risks and control measures in the workplace	<i>Assessor guide: confirm that –</i> The candidate can relate the requirements of environmental regulations and public and personal safety
Criteria 50.5E.3.2 The workplace strategies/procedures to limit danger from static electricity and other sources of ignition are applied	<i>Assessor guide: observe that –</i> The candidate identifies the risks and control measures in the workplace	<i>Assessor guide: confirm that –</i> The candidate can relate the requirements of environmental regulations and public and personal safety
Criteria 50.5E.3.3 Identify protection systems in the workplace: - used to prevent spills entering drains or the water environment - that provide physical barriers to minimise accidental collision with fuelling facilities	<i>Assessor guide: observe that –</i> The candidate identifies the risks and control measures in the workplace	<i>Assessor guide: confirm that –</i> The candidate can relate the requirements of environmental regulations and public and personal safety
Criteria 50.5E.3.4 Interpret signage for public safety needs and Hazchem requirements	<i>Assessor guide: observe that –</i> The candidate identifies the risks and control measures in the workplace	<i>Assessor guide: confirm that –</i> The candidate can relate the requirements of environmental regulations and public and personal safety
Criteria 50.5E.3.5 Emergency stops and shut off devices are identified and activation methods described	<i>Assessor guide: observe that –</i> The candidate identifies the risks and control measures in the workplace	<i>Assessor guide: confirm that –</i> The candidate can relate the requirements of environmental regulations and public and personal safety

Element 50.5E.4 Refill fuel containers**Criteria 50.5E.4.1**

Refill portable liquid fuel tanks and appliances

Assessor guide: observe that –

Workplace approved procedures and areas are used
 Appropriate static control is applied
 Containers for volatile liquid fuels are checked for approved type, condition and suitability
 Sources of ignition are eliminated
 Condition of and dates on gas cylinders are checked for currency
 Adequate ventilation is ensured
 Over fill limiting devices are used
 Appropriate signage, ventilated work area and PPE are used

Assessor guide: confirm that –

The candidate can relate the requirements of approved safe work procedures to environmental regulation and public and personal safety
 Regulatory requirements are identified and explained

Appropriate extinguishing devices and emergency procedures are identified

Criteria 50.5E.4.2

Refill gas cylinders

Assessor guide: observe that –

Workplace approved procedures and areas are used
 Appropriate static control is applied
 Containers for volatile liquid fuels are checked for approved type, condition and suitability
 Sources of ignition are eliminated
 Condition of and dates on gas cylinders are checked for currency
 Adequate ventilation is ensured
 Over fill limiting devices are used
 Appropriate signage, ventilated work area and PPE are used

Assessor guide: confirm that –

The candidate can relate the requirements of approved safe work procedures to environmental regulation and public and personal safety
 Regulatory requirements are identified and explained

Appropriate extinguishing devices and emergency procedures are identified

Criteria 50.5E.4.3

Refill on board fuel tanks

Assessor guide: observe that –

Workplace approved procedures and areas are used
 Appropriate static control is applied
 Containers for volatile liquid fuels are checked for approved type, condition and suitability
 Sources of ignition are eliminated
 Condition of and dates on gas cylinders are checked for currency
 Adequate ventilation is ensured
 Over fill limiting devices are used
 Appropriate signage, ventilated work area and PPE are used

Assessor guide: confirm that –

The candidate can relate the requirements of approved safe work procedures to environmental regulation and public and personal safety
 Regulatory requirements are identified and explained

Appropriate extinguishing devices and emergency procedures are identified

Criteria 50.5E.4.4

Identify emergency procedures for leaks, spills and fire

Assessor guide: observe that –

Workplace approved procedures and areas are used
 Appropriate static control is applied
 Containers for volatile liquid fuels are checked for approved type, condition and suitability
 Sources of ignition are eliminated
 Condition of and dates on gas cylinders are checked for currency
 Adequate ventilation is ensured
 Over fill limiting devices are used
 Appropriate signage, ventilated work area and PPE are used

Assessor guide: confirm that –

The candidate can relate the requirements of approved safe work procedures to environmental regulation and public and personal safety
 Regulatory requirements are identified and explained

Appropriate extinguishing devices and emergency procedures are identified

Element 50.5E.5**Replace gas cylinders****Criteria 50.5E.5.1**

Appliances and pilot lights are turned off

Assessor guide: observe that –

Appropriate ventilation system, signage and PPE are used
 Sources of ignition are eliminated
 Safe work procedures are used
 Appropriate extinguishing devices and emergency procedures are identified

Assessor guide: confirm that –

The candidate explains the reasons for:
 ventilation of the work area and need for personal protection due to contact with gas and leak testing fittings

Criteria 50.5E.5.2

Gas lines are safely vented after closing gas valves

Assessor guide: observe that –

Appropriate ventilation system, signage and PPE are used
 Sources of ignition are eliminated
 Safe work procedures are used
 Appropriate extinguishing devices and emergency procedures are identified

Assessor guide: confirm that –

The candidate explains the reasons for:
 ventilation of the work area and need for personal protection due to contact with gas and leak testing fittings

Criteria 50.5E.5.3

Fittings are leak tested after fitting cylinders

Assessor guide: observe that –

Appropriate ventilation system, signage and PPE are used
 Sources of ignition are eliminated
 Safe work procedures are used
 Appropriate extinguishing devices and emergency procedures are identified

Assessor guide: confirm that –

The candidate explains the reasons for:
 ventilation of the work area and need for personal protection due to contact with gas and leak testing fittings

Criteria 50.5E.5.4

Bottle restraining devices are fitted and adjusted

Assessor guide: observe that –

Appropriate ventilation system, signage and PPE are used
 Sources of ignition are eliminated
 Safe work procedures are used
 Appropriate extinguishing devices and emergency procedures are identified

Assessor guide: confirm that –

The candidate explains the reasons for:
 ventilation of the work area and need for personal protection due to contact with gas and leak testing fittings

Criteria 50.5E.5.5

Identify emergency procedures for leaks and fire
 Sources of ignition are eliminated

Assessor guide: observe that –

Appropriate ventilation system, signage and PPE are used
 ventilation of the work area and need for personal protection due to contact with gas and leak testing fittings
 Safe work procedures are used
 Appropriate extinguishing devices and emergency procedures are identified

Assessor guide: confirm that –

The candidate explains the reasons for:
 protection due to contact with gas and leak testing fittings

Element 50.5E.6 Contain and clean up spills**Criteria 50.5E.6.1**

Potential for spills are identified

Assessor guide: observe that –

The candidate can follow workplace procedures and use equipment correctly
 Clean up equipment is correctly used
 Appropriate cleaning and disposal products are selected and disposed of within workplace procedures and environmental regulations

Assessor guide: confirm that –

The candidate can relate the requirements of approved safe work procedures to environmental regulation and public and personal safety
 Regulatory requirements are identified and explained

Criteria 50.5E.6.2

Procedures for notification of spills are followed
equipment correctly

Assessor guide: observe that –

The candidate can follow workplace procedures and use
work procedures to environmental regulation and public and
Clean up equipment is correctly used
Appropriate cleaning and disposal products are selected and
disposed of within workplace procedures and environmental
regulations

Assessor guide: confirm that –

The candidate can relate the requirements of approved safe
personal safety
Regulatory requirements are identified and explained

Criteria 50.5E.6.3

Workplace procedures are followed to contain spill and
minimise any environment or safety dangers

Assessor guide: observe that –

The candidate can follow workplace procedures and use
equipment correctly
Clean up equipment is correctly used
Appropriate cleaning and disposal products are selected and
disposed of within workplace procedures and environmental
regulations

Assessor guide: confirm that –

The candidate can relate the requirements of approved safe
work procedures to environmental regulation and public and
personal safety
Regulatory requirements are identified and explained

Criteria 50.5E.6.4

Clean up equipment is identified and used

Assessor guide: observe that –

The candidate can follow workplace procedures and use
equipment correctly
Clean up equipment is correctly used
Appropriate cleaning and disposal products are selected and
disposed of within workplace procedures and environmental
regulations

Assessor guide: confirm that –

The candidate can relate the requirements of approved safe
work procedures to environmental regulation and public and
personal safety
Regulatory requirements are identified and explained

Range statement

This unit may be applied in a workplace in which vessels are refuelled involving the use of dangerous goods and hazardous materials, volatile liquids and gasses. Personal protection includes goggles, masks, air helmets, head/hearing protection, fall arrest devices, U.V. protection, safety boots and appropriate work wear. Other equipment includes spill control, containment and clean up.

This unit describes the competencies that are particular to the marine environment.

This unit describes the competencies which are beyond those safety requirements normally applied in the workplace as described in Unit 1.2F (Apply principles of Occupational Health & Safety (OH&S) in work environment)

Refuelling operations include fuel replenishment for vessel propulsion system(s), cooking, refrigeration, water heating systems and power generation systems.

Refuelling includes diesel fuel and petrol in portable and on-board tanks, gas cylinders, liquid fuels such as kerosene, methylated spirits, lighter fluid/white spirits

Spill containment and clean up materials include bunding and drain covers, chemical dispersal agents, absorptive materials, containment booms and portable bunding

Emergency devices include fire extinguishers and hoses, emergency shut off devices

Evidence guide**Assessment context**

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. - All safety clothing and personal safety equipment. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Critical aspects

This unit could be assessed in conjunction with any other units addressing safety, industrial chemicals, communication, materials handling and units associated with working within the recreational boating environment, or other units requiring the exercise of the skills and knowledge covered by this unit.

Competency in this unit cannot be claimed until all pre-requisites have been

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted industry techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities.

Unit MEM 50.6E A Perform basic operational checks on marine craft

Band – Boating Services

Field – Boating services

Unit Weight 0

This unit covers the competencies required to conduct basic checks on the operational condition of vessels in or out of the water

Pre-requisite units - Path 1

50.2A Work safely on marine craft

Element 50.6E.1 Inspect hull and fittings

Criteria 50.6E.1.1

Hull bungs and sea cocks are inspected for security and integrity

Assessor guide: observe that –

Hulls are inspected as far as the location of the vessel allows

Reports on condition of hull and fittings are made promptly following workplace procedures
Any interaction with customers/owners is courteous and informative

Assessor guide: confirm that –

Report matches hull, fittings and mounting condition
Candidate is aware of requirements to courteously provide customers with accurate information

Criteria 50.6E.1.2

Hull condition is checked for holes, cracks and deterioration

Assessor guide: observe that –

Hulls are inspected as far as the location of the vessel allows

Reports on condition of hull and fittings are made promptly following workplace procedures
Any interaction with customers/owners is courteous and informative

Assessor guide: confirm that –

Report matches hull, fittings and mounting condition
Candidate is aware of requirements to courteously provide customers with accurate information

Criteria 50.6E.1.3

Fittings and mountings are checked for security and excessive corrosion

Assessor guide: observe that –

Hulls are inspected as far as the location of the vessel allows

Reports on condition of hull and fittings are made promptly following workplace procedures
Any interaction with customers/owners is courteous and informative

Assessor guide: confirm that –

Report matches hull, fittings and mounting condition
Candidate is aware of requirements to courteously provide customers with accurate information

Criteria 50.6E.1.4

Reports of hull and fitting condition are completed on (any) approved workplace documentation and/or reported verbally

Assessor guide: observe that –

Hulls are inspected as far as the location of the vessel allows

Reports on condition of hull and fittings are made promptly following workplace procedures
Any interaction with customers/owners is courteous and informative

Assessor guide: confirm that –

Report matches hull, fittings and mounting condition
Candidate is aware of requirements to courteously provide customers with accurate information

Element 50.6E.2 Inspect safety equipment for suitability and operation**Criteria 50.6E.2.1**

Requirements for safety equipment for the class of vessel and purpose of use are identified from regulations

Assessor guide: observe that –

Vessel type and class is matched to safety requirements in regulations
 Reports of inadequate safety equipment are made promptly following workplace procedures
 Any interaction with customers/owners is courteous and informative

Assessor guide: confirm that –

Report matches safety equipment condition and suitability
 Candidate is aware of requirements to courteously provide

Criteria 50.6E.2.2

Vessel safety equipment is checked against identified requirements

Assessor guide: observe that –

Vessel type and class is matched to safety requirements in regulations
 Reports of inadequate safety equipment are made promptly following workplace procedures
 Any interaction with customers/owners is courteous and informative

Assessor guide: confirm that –

Report matches safety equipment condition and suitability
 Candidate is aware of requirements to courteously provide

Criteria 50.6E.2.3

Condition of safety equipment is determined and reported if required

Assessor guide: observe that –

Vessel type and class is matched to safety requirements in regulations
 Reports of inadequate safety equipment are made promptly following workplace procedures
 Any interaction with customers/owners is courteous and informative

Assessor guide: confirm that –

Report matches safety equipment condition and suitability
 Candidate is aware of requirements to courteously provide

Element 50.6E.3 Check operating systems**Criteria 50.6E.3.1**

Propulsion, electrical power, steering, cable and line handling and domestic systems are checked for correct fluid levels, fuel state, lubrication and visually for mechanical condition

Assessor guide: observe that –

Fluid levels, belts and fittings are inspected
 Condition of systems is reported as required by workplace procedures
 Engines are started and run (if appropriate)
 Any interaction with customers/owners is courteous and informative

Assessor guide: confirm that –

Report matches equipment condition
 Candidate is aware of requirements to courteously provide customers with accurate information

Criteria 50.6E.3.2

Communication equipment is checked for operational status

Assessor guide: observe that –

Condition of systems is reported as required by workplace procedures
 Any interaction with customers/owners is courteous and informative

Assessor guide: confirm that –

Report matches equipment condition
 Candidate is aware of requirements to courteously provide customers with accurate information

Element 50.6E.4 Inspect cabin and domestic systems**Criteria 50.6E.4.1**

Cabin fittings are inspected for security and integrity

Assessor guide: observe that –

Cabin and domestic systems are inspected as far as the location of the vessel allows
Reports on condition of cabin and domestic systems are made promptly following workplace procedures
Any interaction with customers/owners is courteous and informative

Assessor guide: confirm that –

Report matches cabin and domestic system condition
Candidate is aware of requirements to courteously provide customers with accurate information

Criteria 50.6E.4.2

Cabin and fittings are checked for holes, cracks and deterioration

Assessor guide: observe that –

Cabin and domestic systems are inspected as far as the location of the vessel allows
Reports on condition of cabin and domestic systems are made promptly following workplace procedures
Any interaction with customers/owners is courteous and informative

Assessor guide: confirm that –

Report matches cabin and domestic system condition
Candidate is aware of requirements to courteously provide customers with accurate information

Criteria 50.6E.4.3

Fittings and mountings are checked for security and condition

Assessor guide: observe that –

Cabin and domestic systems are inspected as far as the location of the vessel allows
Reports on condition of cabin and domestic systems are made promptly following workplace procedures
Any interaction with customers/owners is courteous and informative

Assessor guide: confirm that –

Report matches cabin and domestic system condition
Candidate is aware of requirements to courteously provide customers with accurate information

Criteria 50.6E.4.4

Domestic systems are operated to ensure serviceability

Assessor guide: observe that –

Cabin and domestic systems are inspected as far as the location of the vessel allows
Reports on condition of cabin and domestic systems are made promptly following workplace procedures
Any interaction with customers/owners is courteous and informative

Assessor guide: confirm that –

Report matches cabin and domestic system condition
Candidate is aware of requirements to courteously provide customers with accurate information

Criteria 50.6E.4.5

Reports of cabin and fittings condition are completed on (any) approved workplace documentation and/or reported verbally

Assessor guide: observe that –

Cabin and domestic systems are inspected as far as the location of the vessel allows
Reports on condition of cabin and domestic systems are made promptly following workplace procedures
Any interaction with customers/owners is courteous and informative

Assessor guide: confirm that –

Report matches cabin and domestic system condition
Candidate is aware of requirements to courteously provide customers with accurate information

Range statement

This unit may be applied in a workplace in which vessels are checked in or out of water. Basic operational checks relate to inspections of a routine and/or defined nature similar to pre-operational checks undertaken by machinery or vehicle operators.

The level of 'reporting' required in this unit would follow a simple verbal or checklist process and does not require the application of diagnostic, marine survey or complex report writing skills.

Personal protection includes goggles, masks, air helmets, head/hearing protection, fall arrest devices, U.V. protection, safety boots and appropriate work wear.

This unit describes the competencies that are particular to the marine environment.

Operational checks of sail systems are covered in the unit MEM50.7EA "Perform basic operational checks on sails and sail operating equipment.

Where battery 'check' extends beyond a visual inspection and simple operational check, Unit AUR18676A – 'Test, service and replace battery' should be selected

Vessels may be primarily engine or sail powered

This unit applies to engine and mechanical systems, 12 or 24 volt DC electrical switches and connections, hull and steering system checks.

Safety equipment includes flotation devices, communication systems, flares, pumps and bailers, anchor, halyards and chains, EPIRBs, fire extinguishers, torches, life lines

Operating systems include mechanical propulsion systems, steering system, pumping system, low voltage DC electrical system, winches and cable handling equipment, navigational aids and lights

Domestic systems may include water supply and heating, air conditioning and heating, lighting, cooking, refrigeration, sewage and sullage, pumps

Evidence guide**Assessment context**

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. - All safety clothing and personal safety equipment. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Critical aspects

This unit could be assessed in conjunction with any other units addressing safety, communication, and units associated with working within the recreational boating environment, or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all pre-requisites have been satisfied.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted industry techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities.

Unit MEM 50.7E A Perform basic operational checks on sails and sail operating equipment

Band – Boating Services

Field – Boating services

Unit Weight 0

This unit covers the competencies required to conduct basic checks on vessel sail systems

Pre-requisite units - Path 1

50.2A Work safely on marine craft

Element 50.7E.1 Inspect mast(s), boom(s), spars and fittings

Criteria 50.7E.1.1

Masts, booms and spars are inspected for security and integrity

Assessor guide: observe that –

All mast(s) and rigging are inspected
Reports on condition of masts, booms, spars and fittings are made promptly following workplace procedures
Any interaction with customers/owners is courteous and informative

Assessor guide: confirm that –

Report matches mast(s), booms and spars, fittings and mounting condition
Candidate is aware of requirements to courteously provide customers with accurate information

Criteria 50.7E.1.2

Fixed rigging is inspected for security and excessive corrosion

Assessor guide: observe that –

All mast(s) and rigging are inspected
Reports on condition of masts, booms, spars and fittings are made promptly following workplace procedures
Any interaction with customers/owners is courteous and informative

Assessor guide: confirm that –

Report matches mast(s), booms and spars, fittings and mounting condition
Candidate is aware of requirements to courteously provide customers with accurate information

Criteria 50.7E.1.3

Fittings and mountings are checked for security and excessive corrosion

Assessor guide: observe that –

All mast(s) and rigging are inspected
Reports on condition of masts, booms, spars and fittings are made promptly following workplace procedures
Any interaction with customers/owners is courteous and informative

Assessor guide: confirm that –

Report matches mast(s), booms and spars, fittings and mounting condition
Candidate is aware of requirements to courteously provide customers with accurate information

Criteria 50.7E.1.4

Reports of masts, booms, spars, rigging and fittings condition are completed on (any) approved workplace documentation and/or reported verbally

Assessor guide: observe that –

All mast(s) and rigging are inspected
Reports on condition of masts, booms, spars and fittings are made promptly following workplace procedures
Any interaction with customers/owners is courteous and informative

Assessor guide: confirm that –

Report matches mast(s), booms and spars, fittings and mounting condition
Candidate is aware of requirements to courteously provide customers with accurate information

Element 50.7E.2 Inspect sail condition**Criteria 50.7E.2.1**

Sails are inspected for tears, rot and deterioration

Assessor guide: observe that –

All sails are inspected including rigged sails and stored sails
 Reports of inadequate sail condition are made promptly following workplace procedures
 Sails are stowed in the correct manner, order and location after inspection completed
 Any interaction with customers/owners is courteous and informative

Assessor guide: confirm that –

Report matches sail condition
 Candidate is aware of requirements to courteously provide customers with accurate information

Criteria 50.7E.2.2

Sail runners, cleats and reinforcing points are inspected

Assessor guide: observe that –

All sails are inspected including rigged sails and stored sails
 Reports of inadequate sail condition are made promptly following workplace procedures
 Sails are stowed in the correct manner, order and location after inspection completed
 Any interaction with customers/owners is courteous and informative

Assessor guide: confirm that –

Report matches sail condition
 Candidate is aware of requirements to courteously provide customers with accurate information

Criteria 50.7E.2.3

Reports of sails and fittings condition are completed on (any) approved workplace documentation and/or reported verbally

Assessor guide: observe that –

All sails are inspected including rigged sails and stored sails
 Reports of inadequate sail condition are made promptly following workplace procedures
 Sails are stowed in the correct manner, order and location after inspection completed
 Any interaction with customers/owners is courteous and informative

Assessor guide: confirm that –

Report matches sail condition
 Candidate is aware of requirements to courteously provide customers with accurate information

Criteria 50.7E.2.4

Sails are correctly stowed after inspection

Assessor guide: observe that –

All sails are inspected including rigged sails and stored sails
 Reports of inadequate sail condition are made promptly following workplace procedures
 Sails are stowed in the correct manner, order and location after inspection completed
 Any interaction with customers/owners is courteous and informative

Assessor guide: confirm that –

Report matches sail condition
 Candidate is aware of requirements to courteously provide customers with accurate information

Element 50.7E.3 Check sail control cables, ropes and winches**Criteria 50.7E.3.1**

Sail control ropes and cables are inspected for security and integrity

Assessor guide: observe that –

All sail operating systems are inspected
 Reports on condition of sail control systems are made promptly following workplace procedures
 All ropes and cables are re-coiled/returned to correct position
 Lubrication requirements are determined by visual inspection and/or ratchet operation of sealed units
 Any interaction with customers/owners is courteous and informative

Assessor guide: confirm that –

Report matches sail control system condition
 Candidate is aware of requirements to courteously provide customers with accurate information

Criteria 50.7E.3.2

Sail control ropes and cables are re-coiled/returned to correct position

Assessor guide: observe that –

All sail operating systems are inspected
 Reports on condition of sail control systems are made promptly following workplace procedures
 All ropes and cables are re-coiled/returned to correct position
 Lubrication requirements are determined by visual inspection and/or ratchet operation of sealed units
 Any interaction with customers/owners is courteous and informative

Assessor guide: confirm that –

Report matches sail control system condition
 Candidate is aware of requirements to courteously provide customers with accurate information

Criteria 50.7E.3.3

Winches and capstans are checked for operation, lubrication and condition

Assessor guide: observe that –

All sail operating systems are inspected
 Reports on condition of sail control systems are made promptly following workplace procedures
 All ropes and cables are re-coiled/returned to correct position
 Lubrication requirements are determined by visual inspection and/or ratchet operation of sealed units
 Any interaction with customers/owners is courteous and informative

Assessor guide: confirm that –

Report matches sail control system condition
 Candidate is aware of requirements to courteously provide customers with accurate information

Criteria 50.7E.3.4

Fittings and mountings are checked for security and condition

Assessor guide: observe that –

All sail operating systems are inspected
 Reports on condition of sail control systems are made promptly following workplace procedures
 All ropes and cables are re-coiled/returned to correct position
 Lubrication requirements are determined by visual inspection and/or ratchet operation of sealed units
 Any interaction with customers/owners is courteous and informative

Assessor guide: confirm that –

Report matches sail control system condition
 Candidate is aware of requirements to courteously provide customers with accurate information

Criteria 50.7E.3.5

Reports of sail control system condition are completed on (any) approved workplace documentation and/or reported verbally

Assessor guide: observe that –

All sail operating systems are inspected
Reports on condition of sail control systems are made promptly following workplace procedures
All ropes and cables are re-coiled/returned to correct position
Lubrication requirements are determined by visual inspection and/or ratchet operation of sealed units
Any interaction with customers/owners is courteous and informative

Assessor guide: confirm that –

Report matches sail control system condition
Candidate is aware of requirements to courteously provide customers with accurate information

Range statement

This unit may be applied in a workplace in which vessels are checked in or out of water. Basic operational checks relate to inspections of a routine and/or defined nature similar to pre-operational checks undertaken by machinery or vehicle operators.

The level of 'reporting' required in this unit would follow a simple verbal or checklist process and does not require the application of diagnostic, marine survey or complex report writing skills

Personal protection includes goggles, masks, air helmets, head/hearing protection, fall arrest devices, U.V. protection, safety boots and appropriate work wear.

This unit describes the competencies that are particular to the marine environment.

Operational checks of hull and mechanical systems are covered in the unit MEM50.6EA Perform basic operational checks on marine craft

Vessels may be primarily engine or sail powered

This unit applies to sails and sail hoisting and trimming equipment including sail material, sheets, halyards, ropes, wires, cables, shackles, turning blocks, electric and hand powered winches, coffee grinders, self steer systems and self furling sail systems, etc.

Evidence guide**Assessment context**

This unit may be assessed on the job, off the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Assessment conditions

The candidate will be provided with: - All tools, equipment, materials and documentation required. - All safety clothing and personal safety equipment. The candidate will be permitted to refer to the following documents: - Any relevant workplace procedures. - Any relevant product and manufacturing specifications. The candidate will be required to: - Orally, or by other methods of communication, answer questions put by the assessor. - Identify colleagues who can be approached for the collection of competency evidence where appropriate. - Present evidence of credit for any off-job training related to this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Critical aspects

This unit could be assessed in conjunction with any other units addressing safety, communication, materials handling and units associated with working within the recreational boating environment, or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all pre-requisites have been satisfied.

Special notes

During assessment the individual will: - demonstrate safe working practices at all times; - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; - take responsibility for the quality of their own work; - plan tasks in all situations and review task requirements as appropriate; - perform all tasks in accordance with standard operating procedures; - perform all tasks to specification; - use accepted industry techniques, practices, processes and workplace procedures. Tasks involved will be completed within reasonable timeframes relating to typical workplace activities.

Unit MEM 50.8E A Carry out trip preparation and planning

Band – Boating Services

Field – Boating services

Unit Weight 0

This unit covers the competencies to undertake the required steps to plan and prepare for a safe boating trip. This unit was developed by the National Marine Safety Committee (NMSC).

Element 50.8E.1 Maintain the boat and safety equipment

Criteria 50.8E.1.1

Boat is maintained/serviced on a regular basis

Assessor guide: observe that –

Assessor guide: confirm that –

Criteria 50.8E.1.2

Safety equipment complies with relevant legislation

Assessor guide: observe that –

Assessor guide: confirm that –

Criteria 50.8E.1.3

Safety equipment is serviceable, accessible, its location identified and securely and appropriately stowed

Assessor guide: observe that –

Assessor guide: confirm that –

Element 50.8E.2 Maintain mooring and berthing apparatus

Criteria 50.8E.2.1

Mooring and berthing apparatus is maintained/serviced on a regular basis

Assessor guide: observe that –

Assessor guide: confirm that –

Criteria 50.8E.2.2

Mooring apparatus is appropriate to the vessel and location

Assessor guide: observe that –

Assessor guide: confirm that –

Element 50.8E.3 Plan trip

Criteria 50.8E.3.1

Weather conditions, vessel and personnel are checked for suitability for planned trip

Assessor guide: observe that –

Assessor guide: confirm that –

Criteria 50.8E.3.2 Trip activity plan takes into account area and type of operation and emergency contact	<i>Assessor guide: observe that –</i>	<i>Assessor guide: confirm that –</i>
Criteria 50.8E.3.3 Adequate provisions, including fuel, for trip are carried	<i>Assessor guide: observe that –</i>	<i>Assessor guide: confirm that –</i>
Criteria 50.8E.3.4 Trip details are communicated to an appropriate person	<i>Assessor guide: observe that –</i>	<i>Assessor guide: confirm that –</i>
Criteria 50.8E.3.5 Check is made to ensure the number of passengers does not exceed boat design limitations and/or legislative requirements	<i>Assessor guide: observe that –</i>	<i>Assessor guide: confirm that –</i>
Criteria 50.8E.3.6 Check is made to ensure equipment, stores and personal items are securely stowed and do not adversely affect the boat's stability	<i>Assessor guide: observe that –</i>	<i>Assessor guide: confirm that –</i>
Criteria 50.8E.3.7 Appropriate person is informed of safe return from the activity	<i>Assessor guide: observe that –</i>	<i>Assessor guide: confirm that –</i>

Range statement

Maintenance/service of the motor may include but is not limited to:

Oil levels and mix, belts, spark plugs, regular running and flushing of motor including manual starting, raw water intake filters, fuel lines, fillers and tanks, hoses, compliance with program maintenance, electrical wiring, Dead Man's switch, steerage, propeller and shaft condition

Safety equipment may include:

Life-jackets, bailers, dinghy/life-raft, paddles/oars, bilge pump, bucket and line, First Aid kit, fire extinguisher, distress signalling equipment, marine radio, waterproof torch, charts, anchor/sea anchor, lifebuoy, compass, sound signal, drinking water, towing harness, isolating switches, tow rope, local emergency procedures book, sounding equipment, EPIRB, GPS, divers flag, suitable clothing, emergency steering, alternative means of propulsion

Weather and conditions:

Current forecast, wind, latest weather and conditions information, sources of weather information, tides (flood and ebb tides), rips and bars, wave height, visibility, day/night

Area of operation may include:

Hazards, local knowledge, rules and protocols, events, emergency response, access and exit points, safe havens, launching ramps, destination port

Trip activity may include:

Adequate fuel for distance to be travelled, way points, suitability of boat for the activity, radio use and frequency, call signs, trip intention forms, description of boat, registration number, trip departure and return time, area and nature of operation

Persons to advise may include:

Family member, neighbour(s), Water Police, recognised marine rescue services, local police, relative, organisation, club, Harbour Master, note in car, if appropriate, coastal radio stations

Provisions may include:

Water, food, ice, sun protection, wet weather gear, First Aid kit, personal medication for all passengers, batteries, gas, adequate emergency fuel (reserve) and a method of fuel transfer

Mooring and berth maintenance may include:

Appropriateness of mooring/berthing, regularity of checks, services by recognised contractor, serviceable mooring and berthing lines, fenders, anchors and other ground tackle

Activity details to be communicated may include:

Vessel description and photo, number of people in boat, departure/arrival times, types of radios, must advise trip conclusion, shore contact details, trailer registration number, fuel capacity and usage

Pre-start check may include:

Fuel is connected, battery is charged and connected, kill switch, fumes, petrol, fuel and water leaks, open hatches/windows/doors, ventilation, sea-cock opening, secure loose gear, turn on marine radio, checking bilge water levels, navigation lights, raising radio aerials

Evidence guide

Assessment context

Competence in this unit may be assessed in an actual or simulated boating

Critical aspects

Boat is regularly maintained and serviced and pre-departure check completed to ensure readiness for the planned activity. The activity is planned and trip details communicated to an appropriate person.

Assessment conditions

Special notes

Competence in this unit may be assessed over time in a range of boating contexts

Unit MEM 50.9A A Safely operate a mechanically powered recreational boat

Band – Specialisation band A

Field – Boating services

Unit Weight 2

This unit covers the competencies to safely handle/operate a powered recreational boat on coastal and inland waters. This unit was developed by the National Marine Safety Committee (NMSC).

Element 50.9A.1 Manoeuvre and handle boat

Criteria 50.9A.1.1

A pre-start check is undertaken

Assessor guide: observe that –

Assessor guide: confirm that –

Criteria 50.9A.1.2

Motor is prepared and started

Assessor guide: observe that –

Assessor guide: confirm that –

Criteria 50.9A.1.3

Boat is manoeuvred safely according to conditions and in accordance with water traffic regulations

Assessor guide: observe that –

Assessor guide: confirm that –

Criteria 50.9A.1.4

Performance of the boat and personnel is monitored at all times

Assessor guide: observe that –

Assessor guide: confirm that –

Criteria 50.9A.1.5

Impact of boat use on others and the environment is considered

Assessor guide: observe that –

Assessor guide: confirm that –

Criteria 50.9A.1.6

Safety equipment is used, stowed and if required, worn in accordance with legislation and recognised regulations and rules

Assessor guide: observe that –

Assessor guide: confirm that –

Element	50.9A.2	Navigate safely		
Criteria	50.9A.2.1		<i>Assessor guide: observe that –</i>	<i>Assessor guide: confirm that –</i>
	9.2.1 Aids to small craft navigation are identified			
	9.2.2 Collision avoidance techniques are applied when required in accordance with relevant legislation, recognised regulations and rules			
	9.2.3 Operation of the boat is carried out at all times in accordance with relevant legislation, recognised regulations and rules			
	9.2.4 Navigational aids and landmarks are used to determine and monitor boat position			
	9.2.5 Hazards and conditions are taken into account in navigating the boat			
Criteria	50.9A.2.2		<i>Assessor guide: observe that –</i>	<i>Assessor guide: confirm that –</i>
	Collision avoidance techniques are applied when required in accordance with relevant legislation, recognised regulations and rules			
Criteria	50.9A.2.3		<i>Assessor guide: observe that –</i>	<i>Assessor guide: confirm that –</i>
	Operation of the boat is carried out at all times in accordance with relevant legislation, recognised regulations and rules			
Criteria	50.9A.2.4		<i>Assessor guide: observe that –</i>	<i>Assessor guide: confirm that –</i>
	Navigational aids and landmarks are used to determine and monitor boat position			
Criteria	50.9A.2.5		<i>Assessor guide: observe that –</i>	<i>Assessor guide: confirm that –</i>
	Hazards and conditions are taken into account in navigating the boat			
Element	50.9A.3	Anchor the boat		
Criteria	50.9A.3.1		<i>Assessor guide: observe that –</i>	<i>Assessor guide: confirm that –</i>
	Anchorage site is selected in accordance with prevailing and forecast conditions and in accordance with legislation			

Criteria 50.9A.3.2 Type of anchor used is suitable for location	<i>Assessor guide: observe that –</i>	<i>Assessor guide: confirm that –</i>
Criteria 50.9A.3.3 Anchor is lowered, set and monitored according to prevailing conditions	<i>Assessor guide: observe that –</i>	<i>Assessor guide: confirm that –</i>
Criteria 50.9A.3.4 Anchor is retrieved and securely stowed	<i>Assessor guide: observe that –</i>	<i>Assessor guide: confirm that –</i>

Range statement

Manoeuvring conditions may include:

From or to a ramp, pontoon, wharf, mooring, anchor, confined areas (narrow channels, marinas, moorings, obstructions), sea-states: bars, waves, rips, high seas, tidal surges, choppy conditions, low speed/high speed, wakes, poor visibility, effect of wind, large vessels

Safe manoeuvring may include:

Steer straight line, astern, figure-eight, right of way, port-starboard, throttle control, emergency stop, trim and stability of vessel, towing or being towed, berthing, standing-on/stemming the tide, retrieval of person overboard

Monitoring may include:

Cooling system, bilge, portholes and hatches, location and welfare of persons on board, oil, fuel and water, radio, position of boat, other water users, battery and electrical systems, ventilation

Hazards and conditions may include:

Weather, set and drift, effect of wind, tides and currents, submerged objects, other boats/wash, restricted waters, crossing bars

Types of anchors may include:

Danforth, Grapnel/Reef, Bruce, Plough, Admiralty, sea anchor, Sarca

Anchoring systems may include:

Multiple anchors, bow and stern anchors, mooring buoy

Aids to small craft navigation may include:

IALA Buoyage System "A", charts, compasses, GPS, sounder, tide tables, passage plan, marine references, notices to mariners, radio navigational warnings

Impact of boat use on others and the environment may include:

Noise, wake, safety of others, disturbance or injury to wildlife, disposal of waste, effects of detergent, anti-foul, disposal of bilge water, fuelling arrangements

Legislation, procedures and rules may relate to: Collision regulations such as:

Navigating in narrow channels, giving way to other vessels, overtaking, proper lookout, sound signals, lights and shapes, responsibilities and duty of care, use of buoyage system, speed, recognition of lights and markers, rules of road, recognition of operation areas, specific activity rules eg PWCs, water skis, equipment requirements, accident/Incident reporting

Marine regulations such as:

Safety regulations, licensing and registration, speed limit restrictions, distance off requirements, port limits/rules, marine incident reporting, carrying capacity, alcohol limits, age of operators

Environmental and wildlife regulations:

Relevant and applicable State/Territory rules as they apply to the operations of boats

Evidence guide

Assessment context

Competence in this unit may be assessed in an actual or simulated boating

Critical aspects

Operations and anchoring of the boat is conducted safely at all times and in accordance with relevant legislation, regulations and rules.

Assessment conditions

Special notes

Competence in this unit may be assessed over time in a range of boating contexts

Unit MEM 50.10E A Respond to boating emergencies and incidents

Band – Boating Services

Field – Boating services

Unit Weight 0

This unit covers the competencies to deal with boating emergencies and incidents including the use of safety equipment and the provision of assistance to others in distress. This unit was developed by the National Marine Safety Committee (NMSC).

Element 50.10E.1 Use safety equipment

Criteria 50.10E.1.1

Nature, type, location, accessibility and serviceability of safety equipment is known and understood by all personnel on board

Assessor guide: observe that –

Assessor guide: confirm that –

Criteria 50.10E.1.2

Briefing of personnel is conducted before departure

Assessor guide: observe that –

Assessor guide: confirm that –

Criteria 50.10E.1.3

Safety equipment is used in a manner appropriate to the emergency or incident

Assessor guide: observe that –

Assessor guide: confirm that –

Criteria 50.10E.1.4

Safety equipment is used for the purpose for which it was designed

Assessor guide: observe that –

Assessor guide: confirm that –

Element 50.10E.2 Raise alarms

Criteria 50.10E.2.1

Nature of emergency is identified

Assessor guide: observe that –

Assessor guide: confirm that –

Criteria 50.10E.2.2

Alarm is communicated to on-board personnel

Assessor guide: observe that –

Assessor guide: confirm that –

Criteria 50.10E.2.3	<i>Assessor guide: observe that –</i>	<i>Assessor guide: confirm that –</i>
Recognised distress signals are used to indicate need of assistance		
Element 50.10E.3 Deal with on-board emergency		
Criteria 50.10E.3.1	<i>Assessor guide: observe that –</i>	<i>Assessor guide: confirm that –</i>
On board personnel are informed of actions required to deal with the emergency		
Criteria 50.10E.3.2	<i>Assessor guide: observe that –</i>	<i>Assessor guide: confirm that –</i>
Procedures are implemented to combat emergency and protect persons on board		
Criteria 50.10E.3.3	<i>Assessor guide: observe that –</i>	<i>Assessor guide: confirm that –</i>
Position is identified, recorded and communicated		
Criteria 50.10E.3.4	<i>Assessor guide: observe that –</i>	<i>Assessor guide: confirm that –</i>
Injured persons are provided with assistance		
Criteria 50.10E.3.5	<i>Assessor guide: observe that –</i>	<i>Assessor guide: confirm that –</i>
Communication with rescuers is maintained		
Criteria 50.10E.3.6	<i>Assessor guide: observe that –</i>	<i>Assessor guide: confirm that –</i>
Preparation for abandoning the boat is undertaken, if required		
Criteria 50.10E.3.7	<i>Assessor guide: observe that –</i>	<i>Assessor guide: confirm that –</i>
Cessation of emergency is communicated to appropriate personnel		
Element 50.10E.4 Assist others in distress		
Criteria 50.10E.4.1	<i>Assessor guide: observe that –</i>	<i>Assessor guide: confirm that –</i>
Distress signals from others are recognised		

Criteria 50.10E.4.2 Nature of assistance required is identified	<i>Assessor guide: observe that –</i>	<i>Assessor guide: confirm that –</i>
Criteria 50.10E.4.3 Capability to safely assist or relay emergency is determined taking into account own safety and physical proximity to the emergency incident	<i>Assessor guide: observe that –</i>	<i>Assessor guide: confirm that –</i>
Criteria 50.10E.4.4 Appropriate response to the emergency is prepared for and implemented	<i>Assessor guide: observe that –</i>	<i>Assessor guide: confirm that –</i>
Criteria 50.10E.4.5 Cessation of emergency incident is communicated to appropriate personnel	<i>Assessor guide: observe that –</i>	<i>Assessor guide: confirm that –</i>

Range statement

Emergencies may include:

Fire (smoke or heat), collision, grounding, man overboard, person retrieval from water, capsize, swamping, sinking, motor breakdown or malfunction (electrical/mechanical), fouled propeller, anchoring, flooding, lost, injuries/illnesses, hypothermia, lack of fuel, contaminated fuel

Distress signals may include:

Pyrotechnic distress flares, flags, radio, hand signals, dye marker, International Code Signal of Distress, sound signals (including voice), EPIRB, V-sheet, reflective mirror, light signals, mobile phone

Preparing for abandoning includes:

Brief on-board personnel, drinking water, donning of life jackets, identifying location of vessel, communicating to rescuers of actions taken or to be taken, readiness of life raft/rings, activate EPIRB, identification and collection of emergency equipment, provisions and clothing, deployment of anchor and sea anchor

Briefing information may include:

Vessel operation, personnel assessment such as swimming skills, boating knowledge, medication and dietary requirements, location and use of safety equipment, emergency procedures, abandoning procedures

Evidence guide**Assessment context**

Competence in this unit may be assessed in an actual or simulated boating

Critical aspects

Nature of emergency is communicated accurately to on-board personnel, potential rescuers and/or marine authorities. Safety equipment is deployed to suit the nature of the emergency.

Assessment conditions**Special notes**

Competence in this unit may be assessed over time in a range of boating contexts

AUR18676B Test, Service and Replace Batteries

Unit Descriptor

This unit identifies the competence required to service, remove, replace, test and charge automotive batteries. The competency is applicable to batteries fitted to vehicles, plant and equipment and marine applications. It may also be applied to the service, replacement and charging of batteries in electric vehicles such as golf buggies and electric forklifts.

Element	Performance Criteria
1. Test, remove and replace batteries	<ul style="list-style-type: none">1.1 Information required for the work is accessed from appropriate manufacturer's specifications and correctly interpreted.1.2 Relevant occupational health and safety policies and procedures are observed throughout the work processes.1.3 Components, tools and equipment required to complete all work are identified, selected and prepared in accordance with site procedures.1.4 Battery tests are performed and results analysed in accordance with site procedures and manufacturer's specifications.1.5 Battery, testing and replacement procedures are carried out in accordance with relevant legislation, industry and enterprise policies/procedures guidelines.
2. Service and charge batteries	<ul style="list-style-type: none">2.1 Information required for servicing and charging is accessed from appropriate manufacturer's specifications and correctly interpreted.2.2 Components, tools and equipment required to complete all work are identified, selected and prepared in accordance with site procedures.2.3 Electrolyte levels are checked and topped up in accordance with site procedures.2.4 Battery/terminals are cleaned and battery charged in accordance with site procedures.
3. Jump start vehicle	<ul style="list-style-type: none">3.1 Information required for jump start vehicle is accessed from appropriate manufacturer's specifications and correctly interpreted.3.2 Leads are connected/disconnected in correct sequence and polarity.3.3 All work is carried out without causing damage to any component or system.3.4 Workplace records are completed in accordance with enterprises procedures.

Metal and Engineering Training Package

AUR18676B Test service and replace batteries

Range of Variables

Sources of Information/Documents

May include site documentation for battery testing, servicing and replacement, general duty of care, emergency procedures, safe working practices, enterprise operating procedures, customer requirements, industry/workplace codes of practice.

Relevant Site Policies and Procedures

May include hazard policies and procedures, emergency, fire and accident procedures, personal safety procedures, procedures for the use of personal protective clothing and equipment, issue resolution procedures, job procedures, work instructions, quality and environmental procedures.

Legislative Requirements

May include state and territory occupational health and safety legislation and national/state codes of practice.

Occupational Health and Safety Procedures

May include safe manual handling and lifting, customers, staff, equipment/tools, premises and stock.

Components and Tools

May include hand tools, special tools for removal adjustment.

Resources

May include testing equipment including load tester, hydrometer, multimeter or voltmeter and battery charger.

Emergency Procedures

May include sickness, accidents, fire or store evacuation involving staff or customers.

Communications

Communications may be verbal, written, by telephone or by other means.

Installation Action

May include light vehicles and/or plant and equipment and/or plant and equipment and/or heavy commercial vehicles and/or marine applications.

Evidence Guide

Critical Aspects

It is essential that competence in this unit signifies the ability to transfer the competency to changing circumstances and to respond to unusual circumstances in the critical aspects of:

- communicating effectively with others in associated areas
- identifying and assessing hazardous situations and rectifying, where appropriate, or reporting to the relevant personnel
- applying safe manual handling practices
- removing/replacing batteries
- servicing and charging batteries
- testing and jump starting batteries
- safety handling and storing dangerous and/or hazardous goods and substances

Metal and Engineering Training Package

AUR18676B Test service and replace batteries

- completing essential post activity housekeeping
- applying relevant OH&S procedures.

Interdependent Assessment of Units

This unit may be assessed in conjunction with all common and technical units which form part of the normal job role.

Underpinning Knowledge

- General knowledge of common automotive terminology.
- Working knowledge of relevant OH&S regulations/requirements, equipment, material and personal safety requirements.
- Working knowledge of safe manual handling theory and practice.
- Working knowledge of the types and applications batteries.
- Detailed knowledge of testing, servicing and replacing batteries procedures.
- Working knowledge of site reporting procedures.
- Working knowledge of disposal of batteries and acids.
- Working knowledge of servicing, jump starting and battery charging procedures.

Underpinning Skills

- Plain English literacy and communication skills in relation to dealing with others involved in the work.
- Technical literacy and communication skills sufficient to interpret and apply common industry terminology, and interpret technical information and specifications related to battery testing, servicing and replacement.
- Questioning and active listening skills, for example when obtaining information of battery testing, servicing and replacement procedures.
- Research and interpretative skills to locate, interpret and apply relevant operational and safety information for battery testing, servicing and replacement procedures.
- Manipulative and dexterity skills to perform battery testing, servicing and replacement procedures.
- Problem solving skills for a range of differing procedural issues.

Consistency in Performance

It is preferable that assessment reflects a process rather than an event and that it occurs over a period of time to cover the varying circumstances. Evidence of performance may be provided by clients, team leaders/members or other appropriate persons subject to agreed authentication arrangements.

Context for Assessment

Assessment of this unit must be completed on-the-job or in a realistically simulated work environment which reflects a range of battery testing, servicing and replacement.

Resource Implications

The following are required:

- a workplace or simulated workplace
- realistic situations requiring battery testing, servicing and replacement.
- site or equivalent instructions for battery testing, servicing and replacement.
- hazardous chemicals information (and/or dangerous goods if applicable).
- appropriate materials, tools and equipment.

Metal and Engineering Training Package

AUR18676B Test service and replace batteries

- site or equivalent instructions for disposal of batteries and acids.

Key Competencies & Application to Standards

		Level	
	1	2	3
Collecting, analysing & organising information	•		
Communicating ideas & information	•		
Planning & organising activities	•		
Working with others in teams	•		
Using mathematical ideas & techniques	•		
Solving problems		•	
Using technology	•		

AUR37119A DRIVE AND MANOEUVRE TRAILER(S)

UNIT DESCRIPTOR: This unit identifies the competence required to drive and manoeuvre trailers in a work environment applicable to light/heavy vehicle, plant and marine.

ELEMENT OF COMPETENCY	PERFORMANCE CRITERIA
<p>AUR37119A.1 Perform a preliminary safety check.</p>	<p>AUR37119A.1.1 Safety checks are completed without causing damage to any component or system.</p> <p>AUR37119A.1.2 Appropriate vehicle and coupling setup is chosen.</p> <p>AUR37119A.1.3 Safe condition of trailer is determined.</p> <p>AUR37119A.1.4 Safe condition of towing vehicle is determined.</p> <p>AUR37119A.1.5 If trailer contains a “load”, security of load is determined.</p>
<p>AUR37119A.2 Connect trailer to vehicle.</p>	<p>AUR37119A.2.1 Vehicle to trailer alignment is achieved.</p> <p>AUR37119A.2.2 Appropriate manual handling devices are selected and used.</p> <p>AUR37119A.2.3 Trailer is hitched to vehicle and ancillaries connected.</p> <p>AUR37119A.2.4 Connections are tested and checked.</p>
<p>AUR37119A.3 Drive and manoeuvre trailer(s).</p>	<p>AUR37119A.3.1 Brake lockout devices are appropriately set.</p> <p>AUR37119A.3.2 Techniques are used to safely manoeuvre trailer and vehicle in forward and reverse directions, and perform parking functions.</p>
<p>AUR37119A.4 Disconnect trailer from vehicle.</p>	<p>AUR37119A.4.1 Parking devices are applied.</p> <p>AUR37119A.4.2 Appropriate manual handling devices are selected and used.</p> <p>AUR37119A.4.3 Ancillary devices are disconnected and trailer unhitched.</p>

ELEMENT OF COMPETENCY	PERFORMANCE CRITERIA
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AUR37119A.4 (continued) Disconnect trailer from vehicle.	AUR37119A.4.4 All servicing/maintenance activities are carried out according to industry regulations/guidelines, OH&S legislation, statutory legislation and enterprise procedures/policies.
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RANGE OF VARIABLES:

Range of contexts:

This competency standard applies to the following and should be contextualised to the qualification to which it is being applied:

- light/heavy vehicle, plant and marine

Sources of information/documents may include:

- manufacturer specifications
- enterprise operating procedures
- product manufacturer specifications
- customer requirements
- industry/workplace codes of practice

OH&S practices must abide by:

- State/industry OH&S legislation
- Award provisions

Resources may include:

- trailer with non-pivoting axle
- vehicle with towing hitch
- suitable area(s) for manoeuvre to take place
- trailer with pivoting front axle

Methods include:

- sealed and non-sealed surfaces, laden and unladen trailers
- manoeuvres in unrestricted and restricted areas

Methods should be applied under normal operating conditions.

Specific requirements:

- Current drivers licence

Other variables may include:

- tilt and non-tilt trailers, single and multi-axle, day and night manoeuvres

EVIDENCE GUIDE:

Context:

- The underpinning knowledge and skills may be assessed on or off-the-job.
- The assessment of practical skills must take place only after a period of supervised practice and repetitive experience. If workplace conditions are not available, assessment in simulated workplace conditions is acceptable.
- The prescribed outcome must be able to be achieved without direct supervision.

Critical aspects:

It is essential that competence is fully observed and there is the ability to transfer the competency to changing circumstances and to respond to unusual situations in the critical aspects of:

- manoeuvring of trailer in restricted and non-restricted environments without damage to vehicle, trailer or surroundings

Underpinning knowledge:

- Personal safety requirements

Metal and Engineering Training Package

AUR37119A Drive and Manoeuvre Trailer(s)

- Vehicle/trailer safety requirements
- Driving and manoeuvring techniques
- Different trailer types
- Trailer hitching systems
- Loading of trailers and travelling with a loaded trailer
- State and Territory regulations for towing trailers

Practical assessments:

- Manoeuvre trailer in restricted and non-restricted areas
- Access, interpret and apply State and Territory regulations
- Connect a trailer to a vehicle
- Determine if a vehicle/trailer and load is safe for towing

Key Competencies:

	Level
Collect, analyse and organise information	1
Communicate ideas and information	1
Plan and organise activities	1
Work with others and in teams	1
Use mathematical ideas and techniques	1
Solve problems	1
Use technology	2

AUR37271A SERVICE AND REPAIR TRAILERS

UNIT DESCRIPTOR: This unit identifies the competence required to interpret transport regulations, adjust and maintain trailers for the RS&R mechanical and recreational boating streams.

ELEMENT OF COMPETENCY	PERFORMANCE CRITERIA
<p>AUR37271A.1 Interpret Transport Regulations.</p>	<p>AUR37271A.1.1 Information is accessed from relevant State/Territories Transport Regulations.</p> <p>AUR37271A.1.2 Information is accurately interpreted.</p> <p>AUR37271A.1.3 All activities are carried out according to industry regulations/guidelines, OH&S legislation, statutory legislation and enterprise procedures/policies.</p>
<p>AUR37271A.2 Adjust trailers to suit individual applications.</p>	<p>AUR37271A.2.1 Trailers are adjusted without causing damage to any vehicle sections, system or components.</p> <p>AUR37271A.2.2 Information is accessed from appropriate sources to enable this competency element to be carried out using approved methods and equipment in accordance with manufacturer specifications.</p> <p>AUR37271A.2.3 Trailer application is determined and measurements taken in preparation for adjustment.</p> <p>AUR37271A.2.4 Adjustments are carried out in accordance with manufacturer specifications for methods, equipment used and tolerances relative to the vehicle/system.</p> <p>AUR37271A.2.5 All activities are carried out according to industry regulations/guidelines, OH&S legislation, statutory legislation and enterprise procedures/policies.</p>
<p>AUR37271A.3 Maintain and repair trailers as required.</p>	<p>AUR37271A.3.1 Maintenance and repair of trailers is completed without causing damage to any vehicle sections, systems or components.</p> <p>AUR37271A.3.2 Correct information is accessed and interpreted from appropriate manufacturer specifications.</p> <p>AUR37271A.3.3 Trailer is inspected for maintenance repair requirements.</p>

ELEMENT OF COMPETENCY	PERFORMANCE CRITERIA
AUR37271A.3 (continued) Maintain and repair trailers as required.	AUR37271A.3.4 All maintenance and repairs are carried out in accordance with manufacturer specifications for methods, equipment used and tolerances relative to the vehicle/system. AUR37271A.3.5 All maintenance and repairs are carried out according to industry regulations/guidelines, OH&S legislation, statutory legislation and enterprise procedures/policies.

RANGE OF VARIABLES:

Range of contexts:

This competency standard applies to the following and should be contextualised to the qualification to which it is being applied:

- RS&R Mechanical and Recreational Boating streams

Sources of information/documents may include:

- manufacturer specifications
- state/territory transport regulations
- enterprise operating procedures
- product manufacturer specifications
- customer requirements
- industry/workplace codes of practice

OH&S practices must abide by:

- State/industry OH&S legislation
- Award provisions

Resources may include:

- hand tools, power tools
- measuring equipment, lifting equipment
- surface coating applicators
- cleaning equipment
- winterising equipment
- Welding equipment

Methods include:

- Visual, audio - Application of relevant transport regulations
- ADRs

Methods should be applied under normal operating conditions.

Specific requirements:

- Clamps, brackets, blocks, chains, ropes

Other variables may include:

- lubricants, paints, safety glasses, masks etc.
- winterise (trailer preservation/protection during non use)
- recommission (trailer prepared for use after storage/repair)
- galvanised, painted and powder coated surfaces
- rollers and guides
- winches (electrical and manual)
- single and multi axle
- fixed and moveable dolly wheels
- tilting and non tilting mechanisms

Metal and Engineering Training Package

AUR37271A Service and Repair Trailers

- mechanical, air and rubber suspension

EVIDENCE GUIDE:

Context:

- The underpinning knowledge and skills may be assessed on or off-the-job.
- The assessment of practical skills must take place only after a period of supervised practice and repetitive experience. If workplace conditions are not available, assessment in simulated workplace conditions is acceptable.
- The prescribed outcome must be able to be achieved without direct supervision.

Critical aspects:

It is essential that competence is fully observed and there is the ability to transfer the competency to changing circumstances and to respond to unusual situations in the critical aspects of:

- interpretation of legislative and manufacturer requirements
- adjusting and maintaining trailers

Underpinning knowledge:

- Recording and reporting requirements and procedures
- Trailer repair and adjustment procedures
- Personal safety requirements
- Vehicle/trailer safety requirements
- Relevant technical information
- Types of materials and their application
- Relevant transport regulations
- Manufacturer specifications
- Trailer service procedures

Practical assessments:

- Access, interpret and apply technical/legal information.
- Prepare customer reports
- Convey information both orally and in writing
- Maintain records
- Use tools and equipment
- Carry out routine trailer maintenance

Key Competencies:

	Level
Collect, analyse and organise information	1
Communicate ideas and information	2
Plan and organise activities	1
Work with others and in teams	1
Use mathematical ideas and techniques	1
Solve problems	1
Use technology	2

Metal and Engineering Training Package

AUR46108A Carry Out Minor Hull Repairs

AUR46108A CARRY OUT MINOR HULL REPAIRS

UNIT DESCRIPTOR: This unit identifies the competence required to inspect hull for deterioration/damage and repair using approved methods and equipment.

PRE-REQUISITES: AUR23608A Carry out welding, soldering, thermal cutting and thermal heating procedures

ELEMENT OF COMPETENCY	PERFORMANCE CRITERIA
AUR46108A.1 Inspect and repair hull deterioration and damage.	AUR46108A.1.1 Inspection and repair of hull deterioration and damage is completed without causing damage to any system or components. AUR46108A.1.2 Correct information is accessed and interpreted from appropriate manufacturer specifications. AUR46108A.1.3 Hull is inspected and deterioration/damage identified. AUR46108A.1.4 Repairs are carried out in accordance with manufacturer specifications for and tolerances relative to the vessel type. AUR46108A.1.5 All activities are carried out according to industry regulations/ guidelines, OH&S legislation, statutory legislation and enterprise procedures/policies.

RANGE OF VARIABLES:

Range of contexts:

This competency standard applies to the following and should be contextualised to the qualification to which it is being applied:

- RS&R Marine body stream

Sources of information/documents may include:

- vehicle/vessel manufacturer specifications
- manufacturer specifications
- enterprise operating procedures
- product manufacturer specifications
- customer requirements
- industry/workplace codes of practice
- statutory legislation for marine and harbours board requirements

OH&S practices must abide by:

- State/industry OH&S legislation
- Award provisions

Resources may include:

- hand tools, power tools, special tools including: hand tool required for aluminium and fibreglass repair
- fibreglass materials and hardeners
- aluminum filler
- gas metal arc welder

Metal and Engineering Training Package

AUR46108A Carry Out Minor Hull Repairs

- gas tungsten arc welder

Methods include:

- aural, visual and functional assessments
- fibreglass repair techniques
- aluminium repair techniques

Methods should be applied under normal operating conditions.

Specific requirements:

- Petrol and/or light diesel engines

EVIDENCE GUIDE:

Context:

- The underpinning knowledge and skills may be assessed on or off-the-job.
- The assessment of practical skills must take place only after a period of supervised practice and repetitive experience. If workplace conditions are not available assessment, in simulated workplace conditions is acceptable.
- The prescribed outcome must be able to be achieved without direct supervision.

Critical aspects:

It is essential that competence is fully observed and there is the ability to transfer the competency to changing circumstances and to respond to unusual situations in the critical aspects of:

- aluminum hull repairs carried out without causing damage or injury to tools, equipment or personnel.
- fibreglass hull repairs carried out without causing damage or injury to tools, equipment or personnel.

Underpinning knowledge:

- Repair methods
- Measuring and testing procedures
- Relevant technical information
- Relevant marine and harbours board regulations
- Equipment safety requirements
- Vessel safety requirements
- Manufacturer/company policies

Practical assessments:

- Access, interpret and apply technical information
- Apply aluminium and fibreglass repair methods
- Use relevant tools and equipment
- Test systems/components for both technical and legal requirements
- Carry out minor hull repairs

Key Competencies:

	Level
Collect, analyse and organise information	2
Communicate ideas and information	1
Plan and organise activities	1
Work with others and in teams	1
Use mathematical ideas and techniques	1
Solve problems	1
Use technology	1

AUR46335A LAUNCH AND RECOVER VESSELS FROM TRAILER

UNIT DESCRIPTOR: This unit identifies the competence required to launch and recover vessels from a trailer.

ELEMENT OF COMPETENCY	PERFORMANCE CRITERIA
<p>AUR46335A.1 Launching the vessel.</p>	<p>AUR46335A.1.1 Safe launching conditions are to be determined by checking:</p> <ul style="list-style-type: none"> • weather • tidal conditions • launch site <p>AUR46335A.1.2 Pre-launch check is to include:</p> <ul style="list-style-type: none"> • Safety equipment • Hull condition • Propulsion unit • Fuel status • Equipment secured • Removal of detachable trailer fittings <p>AUR46335A.1.3 Vessel is launched ensuring:</p> <ul style="list-style-type: none"> • Vehicle is manoeuvred to position trailer in suitable depth of water on launch way • Safe operation of tilting and winch mechanisms • Damage to all vessels and environment is avoided. • Vessel is moved from launch way to safe area • Vehicle/trailer is parked in suitable area
<p>AUR46335A.2 Recovering the vessel.</p>	<p>AUR46335A.2.1 Trailer is positioned ensuring:</p> <ul style="list-style-type: none"> • Vehicle is manoeuvred to position trailer in suitable depth of water on launch way • Detachable trailer fixtures have been removed <p>AUR46335A.2.2 Vessel is recovered onto trailer, ensuring:</p> <ul style="list-style-type: none"> • Vessel is manoeuvred into recovery area and is aligned with trailer guides and rollers • Safe operation of tilting and winch mechanisms • Damage to all vessels and environment is avoided <p>AUR46335A.2.3 Vessel/trailer is secured by:</p> <ul style="list-style-type: none"> • Moving vehicle/trailer and vessel from the recovery area to a safe position • Securing devices from vessel to trailer are attached and adjusted. • Trailer fixtures are replaced and tested

Metal and Engineering Training Package

AUR46335A Launch and Recover Vessels From Trailer

RANGE OF VARIABLES:

Range of contexts:

This competency standard applies to the following and should be contextualised to the qualification to which it is being applied:

- Automotive RS&R streams – Recreational Boating.

Sources of information/documents may include:

- manufacturer specifications
- enterprise operating procedures
- product manufacturer specifications
- customer requirements
- industry/workplace codes of practice

OH&S practices must abide by:

- State/industry OH&S legislation
- Award provisions

Resources may include:

- vehicle, trailer and vessel
- suitable launch site
- gloves
- hand tools (if required)

Methods include:

- obtaining climate information, site inspection
- driving, inspection, fixture removal
- launching, boat manoeuvres, winch operation, recovery

Methods should be applied under normal operating conditions.

Specific requirements:

- Launch and recover a vessel complying with all safety and regulatory requirements.

Other variables may include:

- vessels (single/multi-hulled, flat bottomed, 'V' and displacement designed)
- tow vehicles (car, truck, tractor, wheel or track driven)
- trailers (tilt/non-tilt, single/multi-axle, fitted with fixed/removable lighting systems, rollers/slides, manual/electric winches)
- launch site surface (sand, gravel, bitumen, concrete, grass)
- launch site location (coastal, estuary, ramp, slip way, marina, harbour)
- salt/fresh water, climatic conditions

EVIDENCE GUIDE:

Context:

- The underpinning knowledge and skills may be assessed on or off-the-job.
- The assessment of practical skills must take place only after a period of supervised practice and repetitive experience. If workplace conditions are not available assessment, in simulated workplace conditions is acceptable.
- The prescribed outcome must be able to be achieved without direct supervision.

Critical aspects:

It is essential that competence is fully observed and there is the ability to transfer the competency to changing circumstances and to respond to unusual situations in the critical aspects of:

- launching and recovering a vessel from a trailer

Underpinning knowledge:

- Licence requirements for vehicle/vessel operation
- Manoeuvring a vehicle and trailer

Metal and Engineering Training Package

AUR46335A Launch and Recover Vessels From Trailer

- Safety and regulatory requirements for launch site
- Pre-launch inspection procedures, equipment requirements and standards.
- Water depth required for vessel floatation
- Trailer winch and tilt mechanism operation and safety requirements

Practical assessments:

- Detect vessels/equipment that fail to meet standard for launching
- Manoeuvre a vehicle/trailer/vessel on the launch way into a suitable launching position
- Launch a vessel with the aid of tilting mechanisms and a winch.
- Recover a vessel with the aid of tilting mechanisms and a winch
- Refit detachable fittings to a trailer and test operation of the lighting system

Key Competencies:

	Level
Collect, analyse and organise information	1
Communicate ideas and information	1
Plan and organise activities	1
Work with others and in teams	1
Use mathematical ideas and techniques	1
Solve problems	1
Use technology	1

AUR46435A LAUNCH AND RECOVER VESSELS FROM CRANES, GANTRIES AND FORKLIFTS

UNIT DESCRIPTOR: This unit identifies the competence required to launch and recover vessels from a crane, gantry or forklift.

ELEMENT OF COMPETENCY	PERFORMANCE CRITERIA
<p>AUR46435A.1 Launch the vessel.</p>	<p>AUR46435A.1.1 Safe launching conditions are to be determined by checking:</p> <ul style="list-style-type: none"> • Weather • Tidal conditions • Launch site <p>AUR46435A.1.2 Pre-launch check is to include:</p> <ul style="list-style-type: none"> • Safety equipment • Hull condition • Propulsion unit • Fuel status • Equipment secured <p>AUR46435A.1.3 Vessel is launched ensuring:</p> <ul style="list-style-type: none"> • Slings and lifting equipment attached to hull are positioned to prevent hull damage and will observe safe lifting practices • Crane, gantry or forklift is manoeuvred to place vessel in suitable depth of water at launch site • Safe operation of crane, gantry or fork lift • Damage to all vessels and environment is avoided • Slings/lifting equipment are removed and vessel is moved from launch site to safe area • Crane, gantry or forklift is moved from launch site
<p>AUR46435A.2 Recover the vessel.</p>	<p>AUR46435A.2.1 Crane, gantry or fork lift is positioned ensuring suitable depth of water is present under lift point.</p> <p>AUR46435A.2.2 Vessel is recovered ensuring:</p> <ul style="list-style-type: none"> • Vessel is manoeuvred into recovery area and is aligned with lifting equipment • Slings and lifting equipment attached to hull are positioned to prevent hull damage and will observe safe lifting practices • Safe operation of the lifting equipment as boat is raised from water • Damage to all vessels and environment is avoided

ELEMENT OF COMPETENCY	PERFORMANCE CRITERIA
AUR46435A.2 (continued) Recover the vessel.	AUR46435A.2.3 Vessel is secured by: <ul style="list-style-type: none"> • Transporting vessel from the recovery area to a safe position (storage or trailer) • Lowering vessel onto storage location or trailer • Removing slings/lifting equipment after vessel is moved from launch site to safe area • Vessel to storage rack (or trailer) securing devices are attached and adjusted • If applicable - trailer fixtures are replaced and tested

RANGE OF VARIABLES:

Range of contexts:

This competency standard applies to the following and should be contextualised to the qualification to which it is being applied:

- Automotive RS&R sector – Recreational Boating

Sources of information/documents may include:

- manufacturer specifications
- enterprise operating procedures
- product manufacturer specifications
- customer requirements
- industry/workplace codes of practice

OH&S practices must abide by:

- State/industry OH&S legislation
- Award provisions

Resources may include:

- personal safety equipment
- crane, gantry or fork lift
- suitable lifting slings or equipment
- suitable launch site
- gloves
- hand tools (if required)

Methods include:

- obtaining climate information, site inspection
 - driving, lifting (powered), inspection
 - launching, boat manoeuvres, winch operation, recovery
- Methods should be applied under normal operating conditions.

Specific requirements:

- Launch and recover a vessel using powered lifting equipment and complying with all safety and regulatory requirements

Other variables may include:

- vessels (single/multi-hulled, flat bottomed, ‘V’ and displacement designed)
- lifting equipment (crane, gantry, forklift, slings, specialised lift equipment)
- boat location (storage or trailer)
- launch site surface (sand, gravel, bitumen, concrete)
- launch site location (ramp, slip way, marina, harbour)
- salt/fresh water, climatic conditions

Metal and Engineering Training Package

AUR46435A Launch and Recover Vessels from Cranes, Gantries and Forklifts

EVIDENCE GUIDE:

Context.:

- The underpinning knowledge and skills may be assessed on or off-the-job.
- The assessment of practical skills must take place only after a period of supervised practice and repetitive experience. If workplace conditions are not available assessment, in simulated workplace conditions is acceptable.
- The prescribed outcome must be able to be achieved without direct supervision.

Critical aspects:

It is essential that competence is fully observed and there is the ability to transfer the competency to changing circumstances and to respond to unusual situations in the critical aspects of:

- launching and recovering a vessel using powered lifting equipment

Underpinning knowledge:

- Licence requirements for lifting equipment/vessel operation
- Maneuvring a crane, forklift and attached vessel
- Safety and regulatory requirements for launch site
- Pre-launch inspection procedures, equipment requirements and standards
- Water depth required for vessel floatation
- Lifting sling/equipment vessel attaching points and safety precautions

Practical assessments:

- Detect vessels/equipment that fail to meet standard for launching
- Attach/remove slings or lifting equipment to a vessel
- Maneuvre a crane/forklift/vessel into suitable launching position
- Launch a vessel with the aid of powered lifting equipment
- Recover a vessel with the aid of powered lifting equipment
- Position a vessel into storage (or onto a trailer)

Key Competencies:

	Level
Collect, analyse and organise information	1
Communicate ideas and information	1
Plan and organise activities	1
Work with others and in teams	1
Use mathematical ideas and techniques	1
Solve problems	1
Use technology	1

AUR46519A DRIVE AND MANOEUVRE MOTOR DRIVEN VESSELS

UNIT DESCRIPTOR: This unit identifies the competence required to assess the seaworthiness of, and drive a motor driven vessel.

ELEMENT OF COMPETENCY	PERFORMANCE CRITERIA
AUR46519A.1 Assess seaworthiness.	AUR46519A.1.1 Seaworthiness of a vessel is assessed by checking: <ul style="list-style-type: none">• All safety equipment for fitment, currency and accessibility• Vessel hull and fittings• Suitability for journey of vessel resources and fuel.
AUR46519A.2 Drive the vessel.	AUR46519A.2.1 Vessel is driven: <ul style="list-style-type: none">• Using appropriate driving techniques for the weather conditions• Giving consideration to other craft and persons• Using vessel equipment according to manufacturer guidelines.

RANGE OF VARIABLES:

Range of contexts:

This competency standard applies to the following and should be contextualised to the qualification to which it is being applied:

- Automotive RS&R sector – Recreational Boating.

Sources of information/documents may include:

- manufacturer specifications
- enterprise operating procedures
- product manufacturer specifications
- customer requirements
- industry/workplace codes of practice

OH&S practices must abide by:

- State/industry OH&S legislation
- Award provisions

Resources may include:

- suitable vessel
- authorisation/licence (if required) for vessel operation
- equipment checklist

Methods include:

- inspecting
- driving

Methods should be applied under normal operating conditions.

Specific requirements:

- Drive a suitably equipped motor driven vessel within all regulatory and safety requirements

Other variables may include:

- vessels (single/multi-hulled, flat bottomed, planning and displacement hulls)
- engines (single/multi-cylinder, inboard/outboard)

Metal and Engineering Training Package

AUR46519A Drive and Manoeuvre Motor Driven Vessels

- drive system (propeller, jet drive)
- conditions (coastal, estuary, day, night)
- water depth, salt/fresh water, climatic conditions

EVIDENCE GUIDE:

Context:

- The underpinning knowledge and skills may be assessed on or off-the-job.
- The assessment of practical skills must take place only after a period of supervised practice and repetitive experience. If workplace conditions are not available assessment, in simulated workplace conditions is acceptable.
- The prescribed outcome must be able to be achieved without direct supervision.

Critical aspects:

It is essential that competence is fully observed and there is the ability to transfer the competency to changing circumstances and to respond to unusual situations in the critical aspects of:

- driving and manoeuvring motor driven vessels

Underpinning knowledge:

- Inspection requirements and standards for safety equipment, hull and fittings
- Regulations related to vessel operation and navigation
- Etiquette and techniques for movement of a vessel
- Manual and powered manoeuvring techniques
- Daily maintenance requirement for vessel
- Operation of the vessel controls and ancillary systems

Practical assessments:

- Detect safety equipment, hull or fitting defects which do not meet specified standards
- Perform daily operating maintenance (as required) on vessel
- Operate all controls and ancillary systems fitted to the vessel
- Drive and manoeuvre the vessel both in channel and open water conditions
- Observe all regulatory requirements while the vessel is under way

Key Competencies:

	Level
Collect, analyse and organise information	1
Communicate ideas and information	1
Plan and organise activities	1
Work with others and in teams	1
Use mathematical ideas and techniques	1
Solve problems	1
Use technology	1

AUR46542A MOOR VESSELS

UNIT DESCRIPTOR: This unit identifies the competence required to enable safe mooring of a vessel.

ELEMENT OF COMPETENCY	PERFORMANCE CRITERIA
AUR46542A.1 Moor vessels.	AUR46542A.1.1 Mooring site selected is appropriate for vessel and: <ul style="list-style-type: none">• Vessel is manoeuvred to mooring without damage to vessel or surrounding environment• Appropriate attachment equipment is selected• Suitable attachment points are located on the mooring and vessel• The vessel is linked to the mooring by secure attachment equipment Buffering equipment is used, if required.

RANGE OF VARIABLES:

Range of contexts:

This competency standard applies to the following and should be contextualised to the qualification to which it is being applied:

- Automotive RS&R sector – Recreational Boating.

Sources of information/documents may include:

- manufacturer specifications
- enterprise operating procedures
- product manufacturer specifications
- customer requirements
- industry/workplace codes of practice

OH&S practices must abide by:

- State/industry OH&S legislation
- Award provisions

Resources may include:

- suitable securing equipment
- buffering equipment
- suitable vessel and mooring
- gloves

Methods include:

- boat driving
- mooring/securing equipment selection, attaching securing equipment

Methods should be applied under normal operating conditions.

Specific requirements:

- Moor a vessel, safely, in water, complying with all local regulations

Other variables may include:

- mooring (recognised mooring system, anchor system, pier or jetty, fixed or floating)
- securing devices (ropes, chains, wires, cables, buoys, tenders, buffers)
- conditions (salt/fresh water, coastal, estuary, marine, day/night, varying water depth)
- climatic (range of weather and water conditions)
- vessel type and size

EVIDENCE GUIDE:

Context:

- The underpinning knowledge and skills may be assessed on or off-the-job.
- The assessment of practical skills must take place only after a period of supervised practice and repetitive experience. If workplace conditions are not available assessment, in simulated workplace conditions is acceptable.
- The prescribed outcome must be able to be achieved without direct supervision.

Critical aspects:

It is essential that competence is fully observed and there is the ability to transfer the competency to changing circumstances and to respond to unusual situations in the critical aspects of:

- safe mooring of a vessel

Underpinning knowledge:

- Regulatory requirements in mooring a vessel.
- Types of mooring methods
- Identification, types and classification of mooring components

Practical assessments:

- Manoeuvre a vessel safely to a mooring site
- Secure a vessel safely to a selection of moorings, requiring the deployment of differing securing method and equipment
- Moor a vessel at a location requiring the deployment of buffering equipment

Key Competencies:

	Level
Collect, analyse and organise information	1
Communicate ideas and information	1
Plan and organise activities	1
Work with others and in teams	1
Use mathematical ideas and techniques	1
Solve problems	1
Use technology	1

AUR46649A PREPARE (WINTERISE) VESSEL SYSTEMS

UNIT DESCRIPTOR: This unit identifies the competence required to prepare a vessel for seasonal shutdown and storage.

ELEMENT OF COMPETENCY	PERFORMANCE CRITERIA
<p>AUR46649A.1 Winterise vessel systems.</p>	<p>AUR46649A.1.1 Work undertaken must match work clearance approved by customer.</p> <p>AUR46649A.1.2 Vessel systems are tested and compared to system specifications prior to winterising.</p> <p>AUR46649A.1.3 Vessel systems which fail testing must be advised to the customer and rectification approval obtained.</p> <p>AUR46649A.1.4 Winterising service procedures are performed:</p> <ul style="list-style-type: none">• For vessel systems nominated and approved on the work order• As prescribed by manufacturer specification• As required for specific customer usage of vessel. <p>AUR46649A.1.5 Report for the customer is prepared detailing:</p> <ul style="list-style-type: none">• Work undertaken• Technical or regulatory requirements.
<p>AUR46649A.2 Maintain work site.</p>	<p>AUR46649A.2.1 Tools and equipment are checked for serviceability and conformity with manufacturer specification.</p> <p>AUR46649A.2.2 Work site is maintained in accordance with local and OH&S guidelines.</p>

RANGE OF VARIABLES:

Range of contexts:

This competency standard applies to the following and should be contextualised to the qualification to which it is being applied:

- Automotive RS&R sector – Recreational Boating

Sources of information/documents may include:

- manufacturer specifications
- enterprise operating procedures
- product manufacturer specifications
- customer requirements
- industry/workplace codes of practice

OH&S practices must abide by:

- State/industry OH&S legislation
- Award provisions

Resources may include:

- tools and equipment suitable for task
- multimeter, test light
- lubrication and cleaning equipment
- anti-corrosion and surface treatments
- specialist service tools
- jacks, floor stands, pit
- fork lift, crane

Methods include:

- reading service data, compiling reports
- manual and powered tool use
- testing, inspecting, adjusting, cleaning, weather proofing components and systems
- manual and powered lifting

Methods should be applied under normal operating conditions.

Specific requirements:

- Perform the service work required to winterise a vessel system in accordance with vessel specifications and customer requirements

Other variables may include:

- vessel may be single or multi-hull, powered/non-powered propulsion system
- open, half or full cabin
- metal and non-metal construction
- remote or direct motion control
- safety equipment
- work may be performed in workshop or on-site (indoor or outdoor), on or off trailer

EVIDENCE GUIDE:

Context:

- The underpinning knowledge and skills may be assessed on or off-the-job.
- The assessment of practical skills must take place only after a period of supervised practice and repetitive experience. If workplace conditions are not available assessment, in simulated workplace conditions is acceptable.
- The prescribed outcome must be able to be achieved without direct supervision.

Critical aspects:

It is essential that competence is fully observed and there is the ability to transfer the competency to changing circumstances and to respond to unusual situations in the critical aspects of:

- testing and winterising vessel systems

Underpinning knowledge:

- Propulsion system requirements and its relationship to vessel systems and associated components.
- Application of mechanical, hydraulic, electrical and electronic principles.
- Safety precautions, properties and use of servicing fluids/lubricants/anti-corrosion products used in winterising procedures
- Servicing requirements as specified by the manufacturer
- Company requirements for entries to job sheets and reports
- Use and application of testing, measuring and specialised servicing equipment
- Vessel classification, system type and component identification
- Tool and equipment use and maintenance requirements

Metal and Engineering Training Package

AUR46649A Prepare (Winterise) Vessel Systems

Practical assessments:

- Identify and evaluate the required winterising procedure
- Explain/report the procedure required to a customer
- Select and use the correct tools/equipment for each task
- Access technical information to determine the service procedure required
- Perform required system services in accordance with the manufacturer specifications and quality standards
- Maintain customer records
- Maintain the equipment/work site in accordance with company and OH&S standards

Key Competencies:

	Level
Collect, analyse and organise information	2
Communicate ideas and information	1
Plan and organise activities	1
Work with others and in teams	1
Use mathematical ideas and techniques	1
Solve problems	1
Use technology	1

AUR46660A RECOMMISSION VESSEL SYSTEMS

UNIT DESCRIPTOR: This unit identifies the competence required to prepare a vessel for use after seasonal shutdown and storage.

ELEMENT OF COMPETENCY	PERFORMANCE CRITERIA
<p>AUR46660A.1 Recommission vessel systems.</p>	<p>AUR46660A.1.1 Work undertaken matches work clearance approved by customer.</p> <p>AUR46660A.1.2 Recommissioning service procedures are performed:</p> <ul style="list-style-type: none"> • For vessel systems nominated and approved on the work order • As prescribed by manufacturer specification • As required for specific customer usage of vessel. <p>AUR46660A.1.3 Vessel systems are tested and compared to system specifications.</p> <p>AUR46660A.1.4 Vessel systems which fail testing are advised to the customer and rectification approval obtained.</p> <p>AUR46660A.1.5 Failed systems are repaired and tested after customer approval is entered on work order.</p> <p>AUR46660A.1.6 Report for the customer is prepared detailing:</p> <ul style="list-style-type: none"> • Work undertaken • Technical or regulatory requirements.
<p>AUR46660A.2 Maintain work site.</p>	<p>AUR46660A.2.1 Tools and equipment are checked for serviceability and conformity with manufacturer specification.</p> <p>AUR46660A.2.2 Work site is maintained in accordance with local and OH&S guidelines.</p>

RANGE OF VARIABLES:

Range of contexts:

This competency standard applies to the following and should be contextualised to the qualification to which it is being applied:

- Automotive RS&R sector – Recreational Boating

Sources of information/documents may include:

- manufacturer specifications
- enterprise operating procedures
- product manufacturer specifications
- customer requirements
- industry/workplace codes of practice

OH&S practices must abide by:

Metal and Engineering Training Package

AUR46660A Recommission Vessel Systems

- State/industry OH&S legislation
- Award provisions

Resources may include:

- tools and equipment suitable for task
- multimeter, test light
- lubrication and cleaning equipment
- specialist service tools
- jacks, floor stands, pit
- fork lift, crane

Methods include:

- reading service data, compiling reports
- manual and powered tool use
- testing, inspecting, adjusting, cleaning and repairing systems
- manual and powered lifting

Methods should be applied under normal operating conditions.

Specific requirements:

- Perform the service work required to recommission vessel systems in accordance with vessel specifications and customer requirements

Other variables may include:

- vessel may be single or multi-hull, powered/non-powered propulsion system
- open, half or full cabin
- metal and non-metal construction
- remote or direct motion control
- safety equipment
- work may be performed in workshop or on-site (indoor or outdoor), on or off trailer

EVIDENCE GUIDE:

Context:

- The underpinning knowledge and skills may be assessed on or off-the-job.
- The assessment of practical skills must take place only after a period of supervised practice and repetitive experience. If workplace conditions are not available assessment, in simulated workplace conditions is acceptable.
- The prescribed outcome must be able to be achieved without direct supervision.

Critical aspects:

It is essential that competence is fully observed and there is the ability to transfer the competency to changing circumstances and to respond to unusual situations in the critical aspects of:

- recommissioning and testing vessel systems.

Underpinning knowledge:

- Propulsion system requirements and its relationship to vessel systems and associated components.
- Application of mechanical, hydraulic, electrical and electronic principles
- Safety precautions, properties and use of servicing fluids/lubricants products used in recommissioning procedures
- Servicing requirements as specified by the manufacturer
- Company requirements for entries to job sheets and reports
- Use and application of testing, measuring and specialised servicing equipment
- Vessel classification, system type and component identification
- Tool and equipment use and maintenance requirements

Practical assessments:

- Identify and evaluate the required recommissioning procedure

Metal and Engineering Training Package

AUR46660A Recommision Vessel Systems

- Explain/report the procedure required to a customer
- Select and use the correct tools/equipment for each task
- Access technical information to determine the service procedure required
- Perform required system services in accordance with the manufacturer specifications and quality standards
- Maintain customer records
- Maintain the equipment/work site in accordance with company and OH&S standards

Key Competencies:

Collect, analyse and organise information
Communicate ideas and information
Plan and organise activities
Work with others and in teams
Use mathematical ideas and techniques
Solve problems
Use technology

Level

2
1
1
1
1
1
1

AUR46749A PREPARE (WINTERISE) ENGINE SYSTEMS

UNIT DESCRIPTOR: This unit identifies the competence required to prepare an engine for seasonal shutdown and storage.

ELEMENT OF COMPETENCY	PERFORMANCE CRITERIA
AUR46749A.1 Winterise engine systems.	AUR46749A.1.1 Work undertaken matches work clearance approved by customer. AUR46749A.1.2 Engine systems are tested and compared to system specifications prior to winterising. AUR46749A.1.3 Engine systems which fail testing are advised to the customer and rectification approval obtained. AUR46749A.1.4 Winterising service procedures are performed: <ul style="list-style-type: none">• For engine systems nominated and approved on the work order• As prescribed by manufacturer specification• As required for specific customer usage of engine AUR46749A.1.5 Report for the customer is prepared detailing: <ul style="list-style-type: none">• Work undertaken• Technical or regulatory requirements
AUR46749A.2 Maintain work site.	AUR46749A.2.1 Tools and equipment are checked for serviceability and conformity with manufacturer specification. AUR46749A.2.2 Work site is maintained in accordance with local and OH&S guidelines.

RANGE OF VARIABLES:

Range of contexts:

This competency standard applies to the following and should be contextualised to the qualification to which it is being applied:

- Automotive RS&R sector – Recreational Boating

Sources of information/documents may include:

- manufacturer specifications
- enterprise operating procedures
- product manufacturer specifications
- customer requirements
- industry/workplace codes of practice

OH&S practices must abide by:

- State/industry OH&S legislation
- Award provisions

Resources may include:

- tools and equipment suitable for task
- multimeter, test light
- lubrication and cleaning equipment
- anti-corrosion surface treatments
- engine, water tank and safe test area
- specialist service tools
- lifting equipment
- engine test facility

Methods include:

- reading service data, compiling reports
- manual and powered tool use
- testing, inspecting, adjusting, cleaning, weather proofing components and systems
- manual and powered lifting

Methods should be applied under normal operating conditions.

Specific requirements:

- Perform the service work required to winterise a engine system in accordance with engine specifications and customer requirements

Other variables may include:

- engine systems may be inboard/outboard, 2 or 4 stroke, single or multi-cylinder
- water or air cooled, electrical/electronic/remote/local control
- carburation or fuel injection, manual or electric start
- petrol, diesel, LPG or electric fuelled
- propeller or jet drive propulsion systems, tilt, trim and manual adjustment
- remote or direct motion control
- work may be performed in workshop or on-site (indoor or outdoor), on or off vessel

EVIDENCE GUIDE:

Context:

- The underpinning knowledge and skills may be assessed on or off-the-job.
- The assessment of practical skills must take place only after a period of supervised practice and repetitive experience. If workplace conditions are not available assessment, in simulated workplace conditions is acceptable.
- The prescribed outcome must be able to be achieved without direct supervision.

Critical aspects:

It is essential that competence is fully observed and there is the ability to transfer the competency to changing circumstances and to respond to unusual situations in the critical aspects of:

- testing and winterising engine systems

Underpinning knowledge:

- Engine system requirements and its relationship to vessel systems and associated components.
- Application of mechanical, hydraulic, electrical and electronic principles
- Safety precautions, properties and use of servicing fluids/lubricants/anti-corrosion products used in winterising procedures
- Servicing requirements as specified by the manufacturer
- Company requirements for entries to job sheets and reports
- Use and application of testing, measuring and specialised servicing equipment
- Engine classification, system type and component identification
- Tool and equipment use and maintenance requirements

Metal and Engineering Training Package

AUR46749A Prepare (Winterise) Engine Systems

Practical assessments:

- Identify and evaluate the required winterising procedure
- Explain/report the procedure required to a customer
- Select and use the correct tools/equipment for each task
- Access technical information to determine the service procedure required
- Perform required system services in accordance with the manufacturer specifications and quality standards
- Maintain customer records
- Maintain the equipment/work site in accordance with company and OH&S standards

Key Competencies:

	Level
Collect, analyse and organise information	2
Communicate ideas and information	1
Plan and organise activities	1
Work with others and in teams	1
Use mathematical ideas and techniques	1
Solve problems	1
Use technology	1

AUR46760A RECOMMISSION ENGINE SYSTEMS

UNIT DESCRIPTOR: This unit identifies the competence required to prepare an engine for use after seasonal shutdown and storage.

ELEMENT OF COMPETENCY	PERFORMANCE CRITERIA
<p>AUR46760A.1 Recommission engine systems.</p>	<p>AUR46760A.1.1 Work undertaken matches work clearance approved by customer.</p> <p>AUR46760A.1.2 Recommissioning service procedures are performed:</p> <ul style="list-style-type: none"> • For engine systems nominated and approved on the work order • As prescribed by manufacturer specification • As required for specific customer usage of engine. <p>AUR46760A.1.3 Engine systems are tested and compared to system specifications.</p> <p>AUR46760A.1.4 Engine systems which fail testing are advised to the customer and rectification approval obtained.</p> <p>AUR46760A.1.5 Failed systems are repaired and tested after customer approval is entered on work order.</p> <p>AUR46760A.1.6 Report for the customer is prepared detailing:</p> <ul style="list-style-type: none"> • Work undertaken • Technical or regulatory requirements.
<p>AUR46760A.2 Work site maintenance.</p>	<p>AUR46760A.2.1 Tools and equipment are checked for serviceability and conformity with manufacturer specification.</p> <p>AUR46760A.2.2 Work site is maintained in accordance with local and OH&S guidelines.</p>

RANGE OF VARIABLES:

Range of contexts:

This competency standard applies to the following and should be contextualised to the qualification to which it is being applied:

- Automotive RS&R sector – Recreational Boating

Sources of information/documents may include:

- manufacturer specifications
- enterprise operating procedures
- product manufacturer specifications
- customer requirements
- industry/workplace codes of practice

OH&S practices must abide by:

Metal and Engineering Training Package

AUR46760A Recommission Engine Systems

- State/industry OH&S legislation
- Award provisions

Resources may include:

- tools and equipment suitable for task
- multimeter, test light
- lubrication and cleaning equipment
- engine, water tank and safe test area
- specialist service tools
- lifting equipment
- engine test facility

Methods include:

- reading service data, compiling reports
- manual and powered tool use
- testing, inspecting, adjusting, cleaning repairing components and systems
- manual and powered lifting

Methods should be applied under normal operating conditions.

Specific requirements:

- Perform the service work required to recommission an engine system in accordance with engine specifications and customer requirements

Other variables may include:

- engine systems may be inboard/outboard, 2 or 4 stroke, single or multi-cylinder
- water or air cooled, electrical/electronic/remote/local control
- carburation or fuel injection, manual or electric start
- petrol, diesel, LPG or electric fuelled
- propeller or jet drive propulsion systems, tilt, trim and manual adjustment
- remote or direct motion control
- work may be performed in workshop or on-site (indoor or outdoor), on or off vessel

EVIDENCE GUIDE:

Context:

- The underpinning knowledge and skills may be assessed on or off-the-job.
- The assessment of practical skills must take place only after a period of supervised practice and repetitive experience. If workplace conditions are not available assessment, in simulated workplace conditions is acceptable.
- The prescribed outcome must be able to be achieved without direct supervision.

Critical aspects:

It is essential that competence is fully observed and there is the ability to transfer the competency to changing circumstances and to respond to unusual situations in the critical aspects of:

- recommissioning and testing engine systems

Underpinning knowledge:

- Engine system requirements and its relationship to vessel systems and associated components.
- Application of mechanical, hydraulic, electrical and electronic principles.
- Safety precautions, properties and use of servicing fluids/lubricant products used in recommissioning procedures
- Servicing requirements as specified by the manufacturer
- Company requirements for entries to job sheets and reports
- Use and application of testing, measuring and specialised servicing equipment
- Engine classification, system type and component identification
- Tool and equipment use and maintenance requirements

Metal and Engineering Training Package

AUR46760A Recommission Engine Systems

Practical assessments:

- Identify and evaluate the required recommissioning procedure
- Explain/report the procedure required to a customer
- Select and use the correct tools/equipment for each task
- Access technical information to determine the service procedure required
- Perform required system services in accordance with the manufacturer specifications and quality standards
- Maintain customer records
- Maintain the equipment/work site in accordance with company and OH&S standards

Key Competencies:

	Level
Collect, analyse and organise information	2
Communicate ideas and information	1
Plan and organise activities	1
Work with others and in teams	1
Use mathematical ideas and techniques	1
Solve problems	1
Use technology	1

Metal and Engineering Training Package

AUR46866A Repair Deck, Hull, Cabin Equipment and Fittings

AUR46866A REPAIR DECK, HULL, CABIN EQUIPMENT AND FITTINGS

UNIT DESCRIPTOR: This unit identifies the competence required to identify customer requirements, interpret specifications and regulations to perform repairs on deck, hull, cabin equipment and fittings.

ELEMENT OF COMPETENCY	PERFORMANCE CRITERIA
AUR46866A Repair deck, hull, cabin equipment and fittings.	<p>AUR46866A.1.1 Vessel deck, hull, cabin equipment and fittings are tested as prescribed by the manufacturer and the test results compared to specifications.</p> <p>AUR46866A.1.2 Deck, hull, cabin equipment and fittings which fail testing are advised to the customer and rectification approval obtained.</p> <p>AUR46866A.1.3 Work undertaken matches work clearance approved by customer.</p> <p>AUR46866A.1.4 Repair procedures are performed:</p> <ul style="list-style-type: none">• For deck, hull, cabin equipment and fittings nominated and approved on the work order• To manufacturer specification and quality standards• As required for specific customer usage of vessel. <p>AUR46866A.1.5 Report for the customer is prepared detailing:</p> <ul style="list-style-type: none">• Work undertaken• Technical or regulatory requirements.
AUR46866A.2 Maintain work site.	<p>AUR46866A.2.1 Tools and equipment are checked for serviceability and conformity with manufacturer specification.</p> <p>AUR46866A.2.2 Work site is maintained in accordance with local and OH&S guidelines.</p>

RANGE OF VARIABLES:

Range of contexts:

This competency standard applies to the following and should be contextualised to the qualification to which it is being applied:

- Automotive RS&R sector – Recreational Boating

Sources of information/documents may include:

- manufacturer specifications
- enterprise operating procedures
- product manufacturer specifications
- customer requirements
- industry/workplace codes of practice

OH&S practices must abide by:

Metal and Engineering Training Package

AUR46866A Repair Deck, Hull, Cabin Equipment and Fittings

- State/industry OH&S legislation
- Award provisions

Resources may include:

- hand tools and equipment suitable for task
- material repair equipment
- wiring repair equipment
- multimeter, test light
- cleaning and defouling equipment
- pneumatic air tools and equipment

Methods include:

- use of hand tools, powered tools, cleaning equipment
- electrical wiring repair, testing by light and meter
- repair applications using wide range of materials
- removal and refitting of deck, hull, cabin equipment and fittings
- recording and reporting (repair details)

Methods should be applied under normal operating conditions.

Specific requirements:

- Repair, to serviceable condition, a wide range of deck, hull, cabin equipment and fittings

Other variables may include:

- size and type of vessel
- material repair (fibreglass, wood, aluminium, steel, plastic, ferro-cement)
- fittings (bollards, ferrules, runners, clamps, cleats, turnbuckles, press studs, brewsters)
- winches (12V, 24V, 240V), capstans
- bow and stern rails, rudder and steering bushes and bearings
- fishing rod, bail boxes and cabin fixtures
- repair may be performed in workshop or on-site, indoor or outdoor

EVIDENCE GUIDE:

Context:

- The underpinning knowledge and skills may be assessed on or off-the-job.
- The assessment of practical skills must take place only after a period of supervised practice and repetitive experience. If workplace conditions are not available assessment, in simulated workplace conditions is acceptable.
- The prescribed outcome must be able to be achieved without direct supervision.

Critical aspects:

It is essential that competence is fully observed and there is the ability to transfer the competency to changing circumstances and to respond to unusual situations in the critical aspects of:

- removal, repair and refitting of deck, hull, cabin equipment and fittings

Underpinning knowledge:

- Repair techniques related to deck, hull, cabin equipment, fittings and the relationship of these parts/fittings to the integrity of the vessel
- Types of materials used in deck, hull, cabin equipment and fittings
- Application of mechanical, hydraulic, electrical and electronic principles
- Safety precautions, properties and use of repair materials and products used in repair procedures
- Repair requirements/standards as specified by the manufacturer
- Company requirements for entries to job sheets and reports
- Use and application of testing, measuring and specialised servicing equipment
- Vessel classification, component type and identification
- Tool and equipment use and maintenance requirements

Metal and Engineering Training Package

AUR46866A Repair Deck, Hull, Cabin Equipment and Fittings

Practical assessments:

- Identify and evaluate the required repair procedure
- Explain/report the repair procedure required to a customer
- Select and use the correct tools/equipment for each task
- Access technical information to determine the repair procedure required
- Perform required repair in accordance with the manufacturer specifications and quality standards
- Maintain customer records
- Maintain the equipment/work site in accordance with company and OH&S standards

Key Competencies:

	Level
Collect, analyse and organise information	2
Communicate ideas and information	1
Plan and organise activities	1
Work with others and in teams	1
Use mathematical ideas and techniques	1
Solve problems	2
Use technology	1

Metal and Engineering Training Package

AUR46870A Service Deck, Hull, Cabin Equipment and Fittings

AUR46870A SERVICE DECK, HULL, CABIN EQUIPMENT AND FITTINGS

UNIT DESCRIPTOR: This unit identifies the competence required to identify customer requirements, interpret specifications and regulations to perform servicing procedures on deck, hull, cabin equipment and fittings.

ELEMENT OF COMPETENCY	PERFORMANCE CRITERIA
AUR46870A Service deck, hull, cabin equipment and fittings.	<p>AUR46870A.1.1 Vessel deck, hull, cabin equipment and fittings are tested as prescribed by the manufacturer and the test results compared to specifications.</p> <p>AUR46870A.1.2 Deck, hull, cabin equipment and fittings which fail testing are advised to the customer and rectification approval is obtained.</p> <p>AUR46870A.1.3 Work undertaken matches work clearance approved by customer.</p> <p>AUR46870A.1.4 Service procedures are performed:</p> <ul style="list-style-type: none">• For deck, hull, cabin equipment and fittings nominated and approved on the work order• As prescribed by manufacturer specification• As required for specific customer usage of vessel. <p>AUR46870A.1.5 Report for the customer is prepared detailing:</p> <ul style="list-style-type: none">• Work undertaken• Technical or regulatory requirements.
AUR46870A.2 Maintain work site.	<p>AUR46870A.2.1 Tools and equipment are checked for serviceability and conformity with manufacturer specification.</p> <p>AUR46870A.2.2 Work site is maintained in accordance with local and OH&S guidelines.</p>

RANGE OF VARIABLES:

Range of contexts:

This competency standard applies to the following and should be contextualised to the qualification to which it is being applied:

- Automotive RS&R sector – Recreational Boating

Sources of information/documents may include:

- manufacturer specifications
- enterprise operating procedures
- product manufacturer specifications
- customer requirements
- industry/workplace codes of practice

OH&S practices must abide by:

Metal and Engineering Training Package

AUR46870A Service Deck, Hull, Cabin Equipment and Fittings

- State/industry OH&S legislation
- Award provisions

Resources may include:

- hand tools and equipment suitable for task
- material repair equipment
- wiring repair equipment
- multimeter, test light
- cleaning and defouling equipment
- pneumatic air tools and equipment
- oxygen, acetylene and LPG equipment

Methods include:

- use of hand tools, powered tools, cleaning equipment
- electrical wiring repair, testing by light and meter
- repair applications using wide range of materials
- welding, heating
- recording and reporting (repair details)

Methods should be applied under normal operating conditions.

Specific requirements:

- Return to serviceable condition a wide range of deck, hull, cabin equipment and fittings

Other variables may include:

- size and type of vessel
- material repair (fibreglass, wood, aluminium, steel, plastic, ferro-cement)
- fittings (bollards, ferrules, runners, clamps, cleats, turnbuckles, press studs, brewsters)
- winches (12V, 24V, 240V), capstans
- bow and stern rails, rudder and steering bushes and bearings
- fishing rod, bail boxes and cabin fixtures
- service may be performed in workshop or on-site, indoor or outdoor

EVIDENCE GUIDE:

Context:

- The underpinning knowledge and skills may be assessed on or off-the-job.
- The assessment of practical skills must take place only after a period of supervised practice and repetitive experience. If workplace conditions are not available assessment, in simulated workplace conditions is acceptable.
- The prescribed outcome must be able to be achieved without direct supervision.

Critical aspects:

It is essential that competence is fully observed and there is the ability to transfer the competency to changing circumstances and to respond to unusual situations in the critical aspects of:

- servicing deck, hull, cabin equipment and fittings

Underpinning knowledge:

- Servicing techniques related to deck, hull, cabin equipment, fittings and the relationship of these parts/fittings to the integrity of the vessel
- Types of materials used in deck, hull, cabin equipment and fittings
- Application of mechanical, hydraulic, electrical and electronic principles
- Safety precautions, properties and use of repair materials and products used in servicing procedures
- Servicing requirements/standards as specified by the manufacturer
- Company requirements for entries to job sheets and reports
- Use and application of testing, measuring and specialised servicing equipment
- Vessel classification, component type and identification
- Tool and equipment use and maintenance requirements

Metal and Engineering Training Package

AUR46870A Service Deck, Hull, Cabin Equipment and Fittings

Practical assessments:

- Identify and evaluate the required servicing procedure
- Explain/report the procedure required to a customer
- Select and use the correct tools/equipment for each task
- Access technical information to determine the service procedure required
- Perform required servicing in accordance with the manufacturer specifications and quality standards
- Maintain customer records
- Maintain the equipment/work site in accordance with company and OH&S standards

Key Competencies:

	Level
Collect, analyse and organise information	2
Communicate ideas and information	1
Plan and organise activities	1
Work with others and in teams	1
Use mathematical ideas and techniques	1
Solve problems	2
Use technology	1

AUR46927A IDENTIFY THE NEED FOR WATER TESTING VESSELS

UNIT DESCRIPTOR: This unit identifies the competence required to inspect vessel, compare test results with specifications and determine if water testing of the vessel is required.

ELEMENT OF COMPETENCY	PERFORMANCE CRITERIA
AUR46927A.1 Inspect vessel.	AUR46927A.1.1 Vessel condition is determined by: <ul style="list-style-type: none">• Collating data from service history – job cards, customer comments, any relevant source.• Performing a visual inspection of vessel noting obvious or potential problems.• Compare inspection results/collated data with manufacturer specification. AUR46927A.1.2 Report for the customer is prepared detailing: <ul style="list-style-type: none">• Condition of vessel.• Further testing which will be required to validate component or system condition.• Costing estimates of recommended repairs and further testing requirements.• Potential service life of components which are still serviceable but have detectable deterioration.

RANGE OF VARIABLES:

Range of contexts:

This competency standard applies to the following and should be contextualised to the qualification to which it is being applied:

- Automotive RS&R sector – Recreational Boating

Sources of information/documents may include:

- manufacturer specifications
- enterprise operating procedures
- product manufacturer specifications
- customer requirements
- industry/workplace codes of practice

OH&S practices must abide by:

- State/industry OH&S legislation
- Award provisions

Resources may include:

- general workshop equipment
- specialised testing equipment suitable for required test

Methods include:

- reading, collating and comparing data, cost estimating, report preparation
- visual inspection, assessment of component condition

Methods should be applied under normal operating conditions.

Specific requirements:

- Inspection standards applied must ensure vessel conforms to relevant specification

Metal and Engineering Training Package

AUR46927A Identify the Need for Water testing Vessels

Other variables may include:

- vessel (type, size, new, modified, developmental, addition to existing vessel)
- local regulations
- testing of some components may be required during inspection procedure
- inspection may be performed in workshop or on-site (indoor or outdoor)

EVIDENCE GUIDE:

Context:

- The underpinning knowledge and skills may be assessed on or off-the-job.
- The assessment of practical skills must only take place after a period of supervised practice and repetitive experience. If workplace conditions are not available assessment in simulated workplace conditions is acceptable.
- The prescribed outcome must be able to be achieved without direct supervision.

Critical aspects:

It is essential that competence is fully observed and there is the ability to transfer the competency to changing circumstances and to respond to unusual situations in the critical aspects of:

- vessel inspection procedures and test requirements

Underpinning knowledge:

- Regulatory requirements in relation to navigation and safety equipment
- Component/system assessment based on manufacturer specification
- Vessel operating systems, components and fittings
- Company business documentation – job cards, service history, releases, performance data systems, estimating, quoting
- Inspection report compilation and presentation

Practical assessments:

- Collate the data required to provide a service history of the vessel
- Inspect the vessel at a standard which will detect vessel component/systems/equipment that do not conform to manufacturer, local or state regulatory authority requirements
- Prepare a condition report that accurately indicates vessel conformity with specifications and regulations
- Prepare an estimate of further testing requirements, recommended repairs and cost implications of repairs

Key Competencies:

	Level
Collect, analyse and organise information	2
Communicate ideas and information	2
Plan and organise activities	1
Work with others and in teams	1
Use mathematical ideas and techniques	2
Solve problems	2
Use technology	1

AUR46930A WATER TEST VESSELS

UNIT DESCRIPTOR: This unit identifies the competence required to water test a vessel to check conformity of the vessel to statutory requirements and configuration.

ELEMENT OF COMPETENCY	PERFORMANCE CRITERIA
<p>AUR46930A.1 Conduct pre-water test safety inspection.</p>	<p>AUR46930A.1.1 Safety of vessel is checked before water testing by:</p> <ul style="list-style-type: none"> • Auditing vessel safety equipment • Visually inspecting systems/ components for conformity to manufacturer specification and/or regulations • Connecting appropriate test equipment • Requiring repair of any system/component that fails the safety inspection to be effected prior to vessel leaving mooring
<p>AUR46930A.2 Water test vessel.</p>	<p>AUR46930A.2.1 Performance data from the relevant unit(s) is recorded during each of the test sequences.</p> <p>AUR46930A.2.2 Engine performance is tested by:</p> <ul style="list-style-type: none"> • Operating the engine through the full operating range • Performing manufacturer test procedures <p>AUR46930A.2.3 Propulsion unit is tested by:</p> <ul style="list-style-type: none"> • Operating the propulsion unit through the full range of speeds and directions • Performing manufacturer test procedure <p>AUR46930A.2.4 Hull and hull fittings are tested by:</p> <ul style="list-style-type: none"> • Operating the hull/hull fittings through the full range of performance conditions • Performing manufacturer test procedures <p>AUR46930A.2.5 Performance data from the water test is compared with manufacturer specifications and a test report prepared containing:</p> <ul style="list-style-type: none"> • Vessel conformity to manufacturer specifications and local/state regulations • Components/systems which “failed” to comply with requirements • Recommended repairs/modifications required for the vessel to conform to water test requirements

Metal and Engineering Training Package

AUR46930A Water Test Vessels

RANGE OF VARIABLES:

Range of contexts:

This competency standard applies to the following and should be contextualised to the qualification to which it is being applied:

- RS&R sector – Recreational Boating

Sources of information/documents may include:

- manufacturer specifications
- enterprise operating procedures
- product manufacturer specifications
- customer requirements
- industry/workplace codes of practice

OH&S practices must abide by:

- State/industry OH&S legislation
- Award provisions

Resources may include:

- access to performance data and relevant regulations
- safe water way allowing performance testing
- test equipment appropriate to a specified test

Methods include:

- auditing, reading, collating and comparing data, report preparation
- visual inspection, assessment of component condition
- inspection (visual and by equipment)
- boat driving, testing

Methods should be applied under normal operating conditions.

Specific requirements:

- Testing and inspection standards applied must ensure vessel conforms to relevant specification and regulations

Other variables may include:

- vessel (type, size, new, modified, developmental, addition to existing vessel)
- engine (type/size, single/multi), propulsion unit (propeller, jet drive)
- hull type (planing, displacement, single, multi-hull), hull fittings
- varying performance data and specification
- state, territory, local regulations and laws
- testing, by use of test equipment, of some components may be required during inspection procedure
- climatic (day/night, salt/fresh water, coastal, estuary or marine, water depth, weather)

EVIDENCE GUIDE:

Context:

- The underpinning knowledge and skills may be assessed on or off-the-job.
- The assessment of practical skills must take place only after a period of supervised practice and repetitive experience. If workplace conditions are not available assessment, in simulated workplace conditions is acceptable.
- The prescribed outcome must be able to be achieved without direct supervision.

Critical aspects:

It is essential that competence is fully observed and there is the ability to transfer the competency to changing circumstances and to respond to unusual situations in the critical aspects of:

- performing a comprehensive water test of a vessel

Underpinning knowledge:

Metal and Engineering Training Package

AUR46930A Water Test Vessels

- Regulatory requirements in relation to navigation and safety equipment
- Boat driving, manoeuvring, etiquette and techniques, navigation
- Distress routines
- Vessel/component/system performance assessment standards based on manufacturer specification and regulatory requirements
- Vessel operating systems, components and fittings
- Company business documentation – job cards, service history, performance data systems.
- Inspection report compilation and presentation

Practical assessments:

- Perform a pre-water test audit and inspection of a vessel
- Conduct a series of engine, propulsion unit, hull and hull fitting tests in accordance with manufacturer specifications and quality standards
- Record the results of performance testing of components/units/systems
- Assess the test data against specifications at a standard which will detect vessel component/systems/equipment that do not conform to manufacturer, local or state regulatory authority requirements
- Prepare a condition report that accurately indicates vessel conformity with specifications and regulations
- Prepare a non-conformity report which indicates further testing requirements and recommended repairs for compliance with specifications and regulations

Key Competencies:

	Level
Collect, analyse and organise information	2
Communicate ideas and information	2
Plan and organise activities	1
Work with others and in teams	1
Use mathematical ideas and techniques	2
Solve problems	2
Use technology	1

AUR46975A WATER TEST ENGINES IN TANKS

UNIT DESCRIPTOR: This unit identifies the competence required to performance test an engine in a water tank.

ELEMENT OF COMPETENCY	PERFORMANCE CRITERIA
<p>AUR46975A.1 Set-up test equipment.</p>	<p>AUR46975A.1.1 Engine is prepared for testing by:</p> <ul style="list-style-type: none"> • Using lifting equipment to locate engine in tank • Checking security of water tank • Ensuring exhaust emissions are removed in conformity with State and Territory law • Test equipment is linked to engine • Fuel and battery are safely located and connected to engine • Safety precautions, warning signs, and work site comply with local and OH&S guidelines
<p>AUR46975A.2 Performance test engine.</p>	<p>AUR46975A.2.1 Performance data is recorded during engine test sequence.</p> <p>AUR46975A.2.2 Test is conducted by:</p> <ul style="list-style-type: none"> • Starting and operating engine through speed ranges specified in test procedure • Ensuring engine, test equipment and surrounding environment are not damaged by incorrect test procedures <p>AUR46975A.2.3 Engine performance is evaluated by comparing recorded data to manufacturer specification.</p> <p>AUR46975A.2.4 Test is concluded by:</p> <ul style="list-style-type: none"> • Disconnecting battery, fuel and test equipment links from engine • Using lifting equipment to lift engine from tank and move engine to safe location • Cleaning work site <p>AUR46975A.2.5 Engine performance report is prepared indicating:</p> <ul style="list-style-type: none"> • Conformity, or non-conformity, with manufacturer specification • Components, if applicable, requiring repair for engine performance to be restored

RANGE OF VARIABLES:

Range of contexts:

This competency standard applies to the following and should be contextualised to the qualification to which it is being applied:

- RS&R sector – Recreational Boating

Sources of information/documents may include:

- manufacturer specifications

Metal and Engineering Training Package

AUR46975A Water Test Engines in Tanks

- enterprise operating procedures
- product manufacturer specifications
- customer requirements
- industry/workplace codes of practice

OH&S practices must abide by:

- State/industry OH&S legislation
- Award provisions

Resources may include:

- access to performance data
- suitable test tank
- engine performance monitoring equipment
- lifting equipment
- hand tools
- test equipment appropriate to a specified test

Methods include:

- reading, recording and comparing data, report preparation
- operating engines, performance monitoring equipment
- use of manual tools
- Assessment and problem identification

Methods should be applied under normal operating conditions.

Specific requirements:

- Performance test an engine

Other variables may include:

- engine (type/size), 2/4 stroke, inboard/outboard, fitted or not fitted to a vessel
- test facility, dynamometer, monitoring equipment
- varying performance data and specification
- State, Territory, local regulations and laws

EVIDENCE GUIDE:

Context:

- The underpinning knowledge and skills may be assessed on or off-the-job.
- The assessment of practical skills must take place only after a period of supervised practice and repetitive experience. If workplace conditions are not available assessment, in simulated workplace conditions is acceptable.
- The prescribed outcome must be able to be achieved without direct supervision.

Critical aspects:

It is essential that competence is fully observed and there is the ability to transfer the competency to changing circumstances and to respond to unusual situations in the critical aspects of:

- performance testing an engine in a water tank

Underpinning knowledge:

- Engine operating systems eg., starting, ignition, charging, hydraulic trim
- Electronic, electrical and hydraulic controls
- Marine engine classification, types and identification of system components
- Engine performance report compilation and presentation
- Company business documentation – job cards, performance and test data

Practical assessments:

- Mount (and remove) an engine into the water tank for performance testing
- Conduct a series of engine performance tests in accordance with manufacturer specifications and quality standards
- Record the results of engine performance tests

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AUR46975A Water Test Engines in Tanks

- Assess the test data against specifications at a standard which will detect engine outputs that do not conform to manufacturer, local or state regulatory authority requirements
- Prepare a condition report that accurately indicates the engine performance and whether repair(s) are required to enable conformity with specifications and regulations
- Maintain the work site in accordance with local and OH&S guidelines

Key Competencies:

	Level
Collect, analyse and organise information	2
Communicate ideas and information	2
Plan and organise activities	1
Work with others and in teams	1
Use mathematical ideas and techniques	2
Solve problems	2
Use technology	2

AUR50318A DISPOSE OF WASTE AND MAINTAIN A TIDY WORK AREA

UNIT DESCRIPTOR: This unit identifies the competence required to remove and dispose of waste matter keeping the work area and surrounds in a tidy and safe condition.

ELEMENT OF COMPETENCY	PERFORMANCE CRITERIA
<p>AUR50318A.1 Access appropriate rubbish pick up equipment.</p>	<p>AUR50318A.1.1 Rubbish pick up equipment relevant to the task is obtained and checked to be in good working order in accordance with manufacturer specifications.</p> <p>AUR50318A.1.2 Protective apparel appropriate to the type of rubbish and litter to be collected is selected.</p> <p>AUR50318A.1.3 All activities are carried out according to industry regulations/ guidelines, OH&S legislation, statutory legislation and enterprise procedures/policies.</p>
<p>AUR50318A.2 Transfer rubbish to portable carrier.</p>	<p>AUR50318A.2.1 Transfer rubbish to portable carrier is completed without causing damage to any machinery or equipment.</p> <p>AUR50318A.2.2 Rubbish is accessed for health, safety, and environmental risks and handled in accordance with relevant enterprise, client and OH&S and statutory requirements.</p> <p>AUR50318A.2.3 Rubbish bin liners are cleaned and/or replaced as necessary to comply with industry/ enterprise standards.</p> <p>AUR50318A.2.4 All activities are carried out according to industry regulations/ guidelines, OH&S legislation, statutory legislation and enterprise procedures/policies.</p>

Metal and Engineering Training Package

AUR50318A Dispose of Waste and Maintain a Tidy Work Area

<p>AUR50318A.3 Deliver rubbish to disposal point.</p>	<p>AUR50318A.3.1 Rubbish is delivered without causing damage to any machinery or equipment.</p> <p>AUR50318A.3.2 Rubbish is transported to disposal point by a practical route and without spillage.</p> <p>AUR50318A.3.3 Mechanical lifting devices where necessary are fitted correctly to trolley/carrier and operated in accordance with manufacturer specifications.</p> <p>AUR50318A.3.4 Reports are made to supervisor when disposal unit is full or hazardous rubbish identified.</p>
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ELEMENT OF COMPETENCY	PERFORMANCE CRITERIA
<p>AUR50318A.3 (continued) Deliver rubbish to disposal point.</p>	<p>AUR50318A.3.5 All activities are carried out according to industry regulations/guidelines, OH&S legislation, statutory legislation and enterprise procedures/policies.</p>
<p>AUR50318A.4 Identify and sort rubbish where required.</p>	<p>AUR50318A.4.1 Sorting is achieved without causing damage to any machinery or equipment.</p> <p>AUR50318A.4.2 Recyclable materials are identified and separated as appropriate.</p> <p>AUR50318A.4.3 All activities are carried out according to industry regulations/guidelines, OH&S legislation, statutory legislation and enterprise procedures/policies.</p>
<p>AUR50318A.5 Clean and store equipment.</p>	<p>AUR50318A.5.1 Equipment is cleaned and stored without causing damage to any machinery or equipment.</p> <p>AUR50318A.5.2 All equipment is washed and dried as appropriate to minimise development of odours and bacteria.</p> <p>AUR50318A.5.3 Equipment is checked to be in good working order before storage in an accessible location.</p> <p>AUR50318A.5.4 All activities are carried out according to industry regulations/ guidelines, OH&S legislation, statutory legislation and enterprise procedures/policies.</p>

RANGE OF VARIABLES:

Metal and Engineering Training Package

AUR50318A Dispose of Waste and Maintain a Tidy Work Area

Range of contexts:

This competency standard applies to the following and should be contextualised to the qualification to which it is being applied:

- RS&R streams

Sources of information/documents may include:

- manufacturer specifications
- enterprise operating procedures
- product manufacturer specifications
- customer requirements
- industry/workplace codes of practice

OH&S practices must abide by:

- State/industry OH&S legislation
- Award provisions

Resources may include:

- compactors, dump master, large waste bins, open trucks, pick up trolley, 240 litre bins with wheels, cleaning cloths, fragrant neutral detergent, bin liners, rubbish bins, protective apparel and equipment (masks etc.)

Methods include:

- hand and machine pick-up and disposal

Methods should be applied under normal operating conditions.

Specific requirements:

- Specialist removal contractors usually deal with toxic and other dangerous wastes or high security waste

Other variables may include:

- wet rubbish types include waste oil, cleaning fluids, coffee, tea, food stuffs, other liquids, dry; old parts, paper, cartons, containers etc.

EVIDENCE GUIDE:

Context:

- The underpinning knowledge and skills may be assessed on or off-the-job.
- The assessment of practical skills must take place only after a period of supervised practice and repetitive experience. If workplace conditions are not available, assessment in simulated workplace conditions is acceptable.
- The prescribed outcome must be able to be achieved without direct supervision.

Critical aspects:

It is essential that competence is fully observed and there is the ability to transfer the competency to changing circumstances and to respond to unusual situations in the critical aspects of:

- interpreting and communicating relevant information
- safe working practices
- methods of pick-up and disposal of waste and litter
- complying with statutory and environmental equipment

Underpinning knowledge:

- The necessary cleaning agents and their uses
- Relevant information
- Equipment safety requirements
- Relevant methods for picking up various types of waste/litter
- Relevant methods for disposal of various types of waste/litter
- Procedures relevant to legislation regarding disposal of toxic and other waste substances
- Manual handling procedures

Metal and Engineering Training Package

AUR50318A Dispose of Waste and Maintain a Tidy Work Area

- Personal safety requirements

Practical assessments:

- Access, interpret and apply relevant information
- Use relevant equipment
- Apply relevant methods for collecting and disposal of various waste/litter
- Apply relevant legislation regarding disposal of toxic and other waste substances
- Apply correct manual handling procedures
- Apply relevant personal safety requirements

Key Competencies:

	Level
Collect, analyse and organise information	1
Communicate ideas and information	1
Plan and organise activities	1
Work with others and in teams	1
Use mathematical ideas and techniques	1

BSBCMN205A Use business technology

Unit Descriptor This unit covers the skills and knowledge required to select, use, and maintain business technology. This technology includes the effective use of computer software to organise information and data.

This unit is related to BSBCMN307A Maintain business resources.

Competency Field Common

Element

Performance Criteria

- | | |
|------------------------------|--|
| 1. Select and use technology | 1.1 Appropriate <i>technology</i> and <i>software</i> applications are selected to achieve the requirements of the task |
| | 1.2 Workspace, furniture and equipment are adjusted to suit the ergonomic requirements of the user |
| | 1.3 Technology is used according to <i>organisational requirements</i> and in a way which promotes a safe work environment |
| 2. Process and organise data | 2.1 Files and records are identified, opened, generated or amended according to task and organisational requirements |
| | 2.2 <i>Input devices</i> are operated according to organisational requirements |
| | 2.3 <i>Data</i> is <i>stored</i> appropriately and applications are exited without damage to or loss of data |
| | 2.4 Manuals, training booklets and/or on-line help or help-desks are used to overcome basic difficulties with applications |
| 3. Maintain technology | 3.1 Used <i>technology consumables</i> are identified and replaced in accordance with manufacturer's instructions and organisational requirements |
| | 3.2 <i>Routine maintenance</i> is carried out and/or arranged in order to ensure that equipment is maintained in accordance with manufacturer's instructions and organisational requirements |
| | 3.3 <i>Equipment faults</i> are accurately identified and action taken in accordance with manufacturer's instructions or by reporting fault to designated person |

Range Statement

The Range Statement provides advice to interpret the scope and context of this unit of competency, allowing for differences between enterprises and workplaces. It relates to the unit as a whole and facilitates holistic assessment. The following variables may be present for this particular unit:

- Legislation, codes and national standards relevant to the workplace which may include:**
- award and enterprise agreements and relevant industrial instruments
 - relevant legislation from all levels of government that affects business operation, especially in regard to Occupational Health and Safety and environmental issues, equal opportunity, industrial relations and anti-discrimination
 - relevant industry codes of practice

- Technology may include:**
- computer technology, such as laptops and PCs
 - digital cameras
 - zip drives
 - modems
 - scanners
 - printers

- Software applications may include:**
- email, internet
 - word processing, spreadsheet, database, accounting, or presentation packages

- Organisational requirements may relate to procedures including:**
- log-on procedures
 - correctly identifying and opening files
 - locating data
 - saving and closing files
 - Occupational Health and Safety policies, procedures and programs
 - storing data
 - manufacturer's guidelines
 - legal and organisation policy/guidelines and requirements

- Input devices may include:**
- keyboard
 - numerical key pad
 - mouse
 - scanner

Range Statement

- Storage of data may include:**
- storage in directories and sub-directories
 - storage on CD-ROMs, hard and floppy disk drives or back up systems
 - appropriate storage/filing of hard copies of computer generated documents

- Technology consumables may include:**
- printer ribbons and cartridges
 - CD-ROM
 - zip disks
 - print heads
 - floppy disks
 - toner cartridges
 - backup tapes

- Routine maintenance may include:**
- regular checking of equipment
 - replacing consumables
 - “in-house” cleaning and servicing of equipment according to manufacturer’s guidelines
 - periodic servicing by qualified or manufacturer approved technician

- Equipment faults or problems may be identified or anticipated by:**
- routine checking of equipment
 - preparation of a maintenance program
 - encouraging feedback from work colleagues
 - regular back-ups of data
 - keeping a log book of detected faults
 - regular Occupational Health and Safety inspections
 - checking that repairs have been carried out

Evidence Guide

The Evidence Guide identifies the critical aspects, underpinning knowledge and skills to be demonstrated to confirm competency for this unit. This is an integral part of the assessment of competency and should be read in conjunction with the Range Statement.

Critical Aspects of Evidence

- Selection and application of functional software applications to produce workplace documents
- Application of Occupational Health and Safety procedures for set up of workstation, operation of computer, changing toner cartridges and other work with plant and substances
- Access, retrieval and storage of required data

Underpinning Knowledge*

* At this level the learner must demonstrate basic operational knowledge in a moderate range of areas.

- The relevant legislation from all levels of government that affects business operation, especially in regard to Occupational Health and Safety and environmental issues, equal opportunity, industrial relations and anti-discrimination
- The organisation's policies, plans and procedures, especially in regard to file-naming and storage conventions
- The correct log-on and shut-down procedures for computer equipment
- Organisational IT procedures including back-up and virus protection procedures
- Basic technical terminology in relation to reading help-files and manuals
- Methods of detecting faults in and solving problems with business technology

Underpinning Skills

- Literacy skills to identify work requirements and understand and process basic, relevant workplace information; follow written instructions;
- Communication skills to request advice, receive feedback and work with a team
- Problem solving skills to solve routine problems
- Keyboarding skills to produce basic workplace documents
- Ability to relate to people from a range of social, cultural and ethnic backgrounds and physical and mental abilities

Evidence Guide

Resource Implications

The learner and trainer should have access to appropriate documentation and resources normally used in the workplace

Consistency of Performance

In order to achieve consistency of performance, evidence should be collected over a set period of time which is sufficient to include dealings with an appropriate range and variety of situations

Context/s of Assessment

- Competency is demonstrated by performance of all stated criteria, including paying particular attention to the critical aspects and the knowledge and skills elaborated in the Evidence Guide, and within the scope as defined by the Range Statement
- Assessment must take account of the endorsed assessment guidelines in the Business Services Training Package
- Assessment of performance requirements in this unit should be undertaken in an actual workplace or simulated environment
- Assessment should reinforce the integration of the key competencies and the Business Services Common Competencies for the particular AQF Level. Refer to the Key Competency Levels at the end of this unit

Key Competency Levels

NB: These levels do not relate to the Australian Qualifications Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Collect, analyse and organise information	Communicate ideas and information	Plan and organise activities	Work with others and in teams	Use mathematical ideas and techniques	Solve problems	Use technology
Level 1	Level 1	Level 1	Level 1	Level 1	Level 1	Level 2

Three levels of performance denote level of competency required to perform a task.

1. Perform 2. Administer 3. Design

- **Collecting, analysing and organising information** – to identify application needs
- **Communicating ideas and information** – with members of the work team
- **Planning and organising activities** – for self
- **Working with teams and others** – in communicating equipment faults
- **Using mathematical ideas and techniques** – when preparing routine maintenance
- **Solving problems** – to identify application problems
- **Using technology** – to complete allocated tasks

Please refer to the Assessment Guidelines for advice on how to use the Key Competencies

BSBCMN206A Process and maintain workplace information

Unit Descriptor

This unit covers the skills and knowledge required to collect, process, store and maintain workplace information and its systems. It includes the maintenance of filing and record systems.

This unit is related to BSBCMN305A Organise workplace information.

Competency Field

Common

Element

Performance Criteria

- | | |
|----------------------------------|---|
| 1. Collect information | 1.1 Collection of <i>information</i> is timely and relevant to organisational needs |
| | 1.2 <i>Business equipment/technology</i> available in the work area is used to obtain information effectively |
| | 1.3 <i>Organisational requirements</i> relating to security and confidentiality are applied to information handling |
| 2. Process workplace information | 2.1 Business equipment/technology is used to process information in accordance with <i>organisational requirements</i> |
| | 2.2 Information is processed in accordance with defined timeframes, guidelines and procedures |
| | 2.3 <i>Information</i> is updated, modified and filed in accordance with organisational requirements |
| | 2.4 Information is collated and despatched in accordance with specified timeframes and organisational requirements |
| 3. Maintain information systems | 3.1 Information and filing systems are maintained in accordance with organisational requirements |
| | 3.2 <i>Inactive or dead files</i> are identified, <i>removed</i> and/or <i>relocated</i> in accordance with organisational requirements |
| | 3.3 New files are established and assembled in accordance with organisational requirements |
| | 3.4 Reference and index systems are updated in accordance with organisational requirements |

Range Statement

The Range Statement provides advice to interpret the scope and context of this unit of competency, allowing for differences between enterprises and workplaces. It relates to the unit as a whole and facilitates holistic assessment. The following variables may be present for this particular unit:

- Legislation, codes and national standards relevant to the workplace which may include:**
- award and enterprise agreements and relevant industrial instruments
 - relevant legislation from all levels of government that affects business operation, especially in regard to Occupational Health and Safety and environmental issues, equal opportunity, industrial relations and anti-discrimination
 - relevant industry codes of practice

- Information may include:**
- correspondence (faxes, memos, letters, email)
 - computer databases (library catalogue, customer records)
 - computer files (letters, memos and other documents)
 - sales records (monthly forecasts, targets achieved)
 - forms (insurance forms, membership forms)
 - invoices (from suppliers, to debtors)
 - personnel records (personal details, salary rates)
 - minutes of meetings

- Business equipment/technology may include:**
- photocopier
 - computer
 - printer
 - binder
 - filing systems (manual/computerised/electronic)
 - answering machine
 - fax machine
 - telephone

Range Statement

Organisational requirements may include:

- procedures for deciding which records should be captured and filed
- security procedures
- legal and organisation policy/guidelines and requirements
- despatching and collecting procedures
- procedures for updating records
- Occupational Health and Safety policies, procedures and programs

Removing inactive or dead files may include:

- transferring records from the active filing system to secondary storage
- transferring files at regular intervals or routinely checking for dead or inactive files
- periodically archive or delete files
- compressing computer files prior to archiving

Relocation of information may include:

- electronic (email, internet access, diskette, tape, CD-ROM)
- microfilm
- printed material
- photographic material

Evidence Guide

The Evidence Guide identifies the critical aspects, underpinning knowledge and skills to be demonstrated to confirm competency for this unit. This is an integral part of the assessment of competency and should be read in conjunction with the Range Statement.

Critical Aspects of Evidence

- Application of organisational policies and procedures for collecting and processing workplace information
- Maintains accuracy in recording and documenting information
- Correct storage and classification of documents
- Maintenance of information records

Evidence Guide

Underpinning Knowledge*

* At this level the learner must demonstrate basic operational knowledge in a moderate range of areas.

- The relevant legislation from all levels of government that affects business operation, especially in regard to Occupational Health and Safety and environmental issues, equal opportunity, industrial relations and anti-discrimination
- Understanding of organisation's business and structure
- Knowledge of the organisation's record keeping/filing systems and security procedures
- Understanding organisational policies and procedures relating to collecting and processing workplace information

Underpinning Skills

- Literacy skills to read and understand organisation's recordkeeping and information (including classification) systems; follow sequenced written instructions; to comprehend/interpret nature of record content
- Interpreting and applying relevant access and security rules and conditions
- Planning skills to organise work priorities and arrangements
- Problem solving skills to solve routine problems
- Technology skills including the ability to select and use technology appropriate to a task
- Communication skills including reporting of information
- Numeracy skills in relation to sequencing and indexing files
- Ability to relate to people from a range of social, cultural and ethnic backgrounds and physical and mental abilities

Resource Implications

The learner and trainer should have access to appropriate documentation and resources normally used in the workplace

Consistency of Performance

In order to achieve consistency of performance, evidence should be collected over a set period of time which is sufficient to include dealings with an appropriate range and variety of situations

Evidence Guide

Context/s of Assessment

- Competency is demonstrated by performance of all stated criteria, including paying particular attention to the critical aspects and the knowledge and skills elaborated in the Evidence Guide, and within the scope as defined by the Range Statement
- Assessment must take account of the endorsed assessment guidelines in the Business Services Training Package
- Assessment of performance requirements in this unit should be undertaken in an actual workplace or simulated environment
- Assessment should reinforce the integration of the key competencies and the Business Services Common Competencies for the particular AQF Level. Refer to the Key Competency Levels at the end of this unit

Key Competency Levels

NB: These levels do not relate to the Australian Qualifications Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Collect, analyse and organise information	Communicate ideas and information	Plan and organise activities	Work with others and in teams	Use mathematical ideas and techniques	Solve problems	Use technology
Level 2	Level 1	Level 1	Level 1	Level 1	Level 1	Level 1

Three levels of performance denote level of competency required to perform a task.

1. Perform 2. Administer 3. Design

- **Collecting, analysing and organising information** – to store and despatch information
- **Communicating ideas and information** – with members of the work team
- **Planning and organising activities** – for collating and filing information
- **Working with teams and others** – in completing scheduled tasks
- **Using mathematical ideas and techniques** – in filing information
- **Solving problems** – to store and despatch information
- **Using technology** – to complete allocated tasks

Please refer to the Assessment Guidelines for advice on how to use the Key Competencies

BSBCMN207A Prepare and process financial/business documents

Unit Descriptor This unit covers the processing of financial transactions including petty cash, invoicing and banking in a business environment.

This unit is related to BSBCMN308A Maintain financial records.

Competency Field Common

Element	Performance Criteria
1. Process petty cash transactions	<p>1.1 Petty cash claims and vouchers are <i>checked</i> for approval, accuracy and authenticity prior to processing</p> <p>1.2 <i>Petty cash transactions</i> are processed and recorded within designated time limits</p> <p>1.3 Irregularities are noted and referred to <i>nominated person</i> for resolution</p> <p>1.4 Transactions are checked and petty cash book balanced according to <i>organisational requirements</i></p>
2. Prepare and process banking documents	<p>2.1 Deposits and withdrawals are accurately entered and balanced according to organisational requirements</p> <p>2.2 Cheques and credit card vouchers are checked for validity (signatures, dates, amounts) before processing</p> <p>2.3 Cash, cheques and credit cards are listed on banking forms in accordance with the <i>banking institution's guidelines</i></p> <p>2.4 Pay-in documentation is reconciled with all money calculations</p>
3. Reconcile invoices for payment to creditors	<p>3.1 Discrepancies between invoices and <i>source documents</i> are identified and reported to nominated person for resolution</p> <p>3.2 Adjustments and errors are identified, reported and rectified in accordance with organisational requirements</p> <p>3.3 Creditor enquiries are answered and/or referred to nominated person for resolution</p>
4. Prepare invoices for debtors	<p>4.1 Invoices are prepared accurately in accordance with organisational requirements</p> <p>4.2 Invoices are distributed to nominated person for verification prior to despatch</p> <p>4.3 Adjustments are made as required in accordance with organisational requirements</p>

Element

Performance Criteria

- 4.4 Invoices and other related documents are copied and filed for auditing purposes

Range Statement

The Range Statement provides advice to interpret the scope and context of this unit of competency, allowing for differences between enterprises and workplaces. It relates to the unit as a whole and facilitates holistic assessment. The following variables may be present for this particular unit:

Legislation, codes and national standards relevant to the workplace which may include:

- award and enterprise agreements and relevant industrial instruments
- relevant legislation from all levels of government that affects business operation, especially in regard to Occupational Health and Safety and environmental issues, equal opportunity, industrial relations and anti-discrimination
- relevant industry codes of practice

Checking claims for accuracy and authenticity may include:

- requiring a receipt
- ensuring items purchased are business related
- accepting claims from authorised personnel only

Recording petty cash transactions may include:

- paper based
- electronic
- organisational accounting system

Nominated persons include:

- petty cash officer
- supervisor
- accounts department

Range Statement

Organisational requirements may include:

- totalling and balancing petty cash book procedures
- legal and organisation policy/guidelines and requirements
- all cash being accounted for at all times
- procedures for entering and balancing deposits
- procedures for checking validity of cheques and credit card vouchers
- security procedures
- Occupational Health and Safety policies, procedures and programs
- format of documents for reimbursement
- guidelines for updating receipts
- Australian Accounting and Auditing standards
- designated timelines for petty cash period/pay period

Banking institution's guidelines may include:

- deposit slips filled out accurately
- cash bundled
- banking summary provided
- banking electronically

Source documents may include:

- purchase orders
- invoices
- receipts
- delivery dockets/receipts
- credit notes
- statements
- remittance advices
- deposit books

Evidence Guide

The Evidence Guide identifies the critical aspects, underpinning knowledge and skills to be demonstrated to confirm competency for this unit. This is an integral part of the assessment of competency and should be read in conjunction with the Range Statement.

Critical Aspects of Evidence

- Application of organisations policy and procedures for financial transactions in regard to petty cash, invoicing and bank processes
- Accurate processing of petty cash claims and vouchers including identification of irregularities or errors
- Accurate preparing and processing of banking documents including identification of irregularities or errors
- Accurate reconciliation and payment of invoices for creditors and debtors including identification of irregularities or errors
- The recording and reporting of transactions

Underpinning Knowledge*

* At this level the learner must demonstrate basic operational knowledge in a moderate range of areas.

- The relevant legislation from all levels of government that affects business operation, especially in regard to Occupational Health and Safety and environmental issues, equal opportunity, industrial relations and anti-discrimination
- Understanding procedures for cash and non-cash handling
- Knowledge of organisational policies and procedures relating to petty cash, banking, security, invoicing procedures relating to debtors and creditors
- Understanding banking institution's guidelines
- Knowledge of methods and techniques for simple calculations
- Methods of presenting financial data

Evidence Guide

Underpinning Skills

- Literacy skills to read and interpret financial information; maintain records and banking documents
- Numeracy skills for checking accuracy of calculations and reconciliations of accounts
- Proofreading skills for maintaining accuracy of information
- Communication skills including reporting of irregularities and errors
- Ability to relate to people from a range of social, cultural and ethnic backgrounds and physical and mental abilities

Resource Implications

The learner and trainer should have access to appropriate documentation and resources normally used in the workplace

Consistency of Performance

In order to achieve consistency of performance, evidence should be collected over a set period of time which is sufficient to include dealings with an appropriate range and variety of situations

Context/s of Assessment

- Competency is demonstrated by performance of all stated criteria, including paying particular attention to the critical aspects and the knowledge and skills elaborated in the Evidence Guide, and within the scope as defined by the Range Statement
- Assessment must take account of the endorsed assessment guidelines in the Business Services Training Package
- Assessment of performance requirements in this unit should be undertaken in an actual workplace or simulated environment
- Assessment should reinforce the integration of the key competencies and the Business Services Common Competencies for the particular AQF Level. Refer to the Key Competency Levels at the end of this unit

Key Competency Levels

NB: These levels do not relate to the Australian Qualifications Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Collect, analyse and organise information	Communicate ideas and information	Plan and organise activities	Work with others and in teams	Use mathematical ideas and techniques	Solve problems	Use technology
Level 2	Level 1	Level 1	Level 1	Level 2	Level 1	Level 1

Three levels of performance denote level of competency required to perform a task.

1. Perform 2. Administer 3. Design

- **Collecting, analysing and organising information** – to process financial documentation
- **Communicating ideas and information** – with members of the work team
- **Planning and organising activities** – for payment of invoices etc
- **Working with teams and others** – in completing scheduled tasks
- **Using mathematical ideas and techniques** – in processing business transactions
- **Solving problems** – to identify irregularities and errors
- **Using technology** – to complete allocated tasks

Please refer to the Assessment Guidelines for advice on how to use the Key Competencies

BSBCMN212A Handle mail

Unit Descriptor

The unit is based on and equivalent to BSAINF101A and BSAINF201A (together) from BSA97 Administration Training Package (enhanced).

The unit covers receiving and distributing incoming mail, collecting and despatching outgoing mail, and organising and sending electronic mail.

This unit is related to BSBCMN305A Organise workplace information.

Competency Field

Common

Element

Performance Criteria

- | | |
|--|---|
| 1. Receive and distribute incoming mail | 1.1 <i>Incoming mail is checked</i> and registered in accordance with organisational policy and procedures |
| | 1.2 Titles and locations of company personnel and departments are identified |
| | 1.3 Urgent and confidential mail is identified and <i>distributed</i> in accordance with organisational requirements |
| | 1.4 Mail is <i>sorted</i> and despatched to the <i>nominated person/location</i> in accordance with organisational requirements |
| | 1.5 <i>Damaged, suspicious or missing items</i> are recorded and/or reported in accordance with organisational policy and procedures |
| 2. Receive and despatch outgoing mail | 2.1 Outgoing mail is collected, checked and sorted to ensure all items are <i>correctly prepared for despatch</i> in accordance with organisational policy and procedures |
| | 2.2 Outgoing mail is <i>recorded</i> and <i>processed</i> for <i>despatch</i> in accordance with organisational requirements |
| | 2.3 Mail is <i>despatched</i> to meet designated timelines |
| 3. Organise urgent and same day deliveries | 3.1 Items are prepared for urgent delivery in accordance with organisational requirements and the carrier's specifications |
| | 3.2 <i>Delivery options</i> are evaluated and the <i>best option</i> for delivery is selected |
| | 3.3 Lodgement or pick up of emergency deliveries is organised and followed up if necessary |

Element

Performance Criteria

- | | |
|--------------------------------------|---|
| 4. Organise and send electronic mail | 4.1 <i>Distribution lists</i> are prepared/maintained in accordance with organisational requirements |
| | 4.2 Mail message/s are <i>checked for accuracy</i> and any attachments are identified and <i>prepared</i> in accordance with organisational and service provider requirements |
| | 4.3 Outgoing mail is recorded/stored in accordance with organisational requirements |
| | 4.4 Mail is <i>despatched</i> to meet designated timelines |

Range Statement

The Range Statement provides advice to interpret the scope and context of this unit of competency, allowing for differences between enterprises and workplaces. It relates to the unit as a whole and facilitates holistic assessment. The following variables may be present for this particular unit:

Legislation, codes and national standards relevant to the workplace may include:

- award and enterprise agreements and relevant industrial instruments
- relevant legislation from all levels of government that affects business operation, especially in regard to Occupational Health and Safety and environmental issues, equal opportunity, industrial relations and anti-discrimination
- relevant industry codes of practice

Incoming mail may include:

- paper based
- electronic (eg faxes, emails to central address)
- internal
- external
- urgent
- confidential/personal
- letters
- journals/magazines
- other correspondence

Checking mail may include:

- mail marked 'confidential', 'urgent' or 'personal'
- mail sent "express post" or registered
- mail that has been damaged
- mail that looks suspicious
- enclosures

Range Statement

Registering of mail may include:

- the date received
- the sender
- the addressee
- the subject
- the contents eg cheque
- assigning a file number
- the condition of mail item (damaged, no return address)

Delivery of urgent and confidential mail may include:

- separating and prioritising urgent mail
- immediate, hand delivery, express post, registered

Sorting mail may include:

- separating urgent mail to be distributed first
- sorting by departments
- sorting by location
- sorting by seniority of personnel
- separating internal (organisational) mail and external mail
- separating by order of importance for each individual
- separating junk mail
- sorting invoices, cheques and accounts
- adding a circulation slip

Nominated person/location may include:

- department
- individual addressee
- administrative support person

Damaged, suspicious or missing items may include:

- mail exposed to the weather (water damage from rain)
- mail roughly handled (broken contents, torn address labels)
- pilfered mail (contents may be missing, parcels slit opened)
- mail that looks unusual
- mail that makes noises
- mail that smells strange
- mail that looks like it has been interfered with (re-sealed mail)

Range Statement

Action in relation to damaged, missing or suspicious items may include:

- contacting the sender to ensure everything sent was received
- negotiating the replacement of missing or damaged items with the sender
- filling out forms for the sender's insurance company
- not touching or moving suspicious mail
- calling the supervisor or security staff immediately

Correctly preparing mail items for despatch may include:

- checking the address details and layout are correct
- checking letter and envelope are addressed to same person
- checking that the letter has been signed
- checking enclosures
- checking that the address is not obscured
- checking that the return address is included
- determining the most appropriate carrier
- ensuring the correct requirements for the chosen carrier are being followed
- preparing bulk mailouts

Mail records may include:

- electronic (specialist software, database, spreadsheet systems)
- paper based (mail book, form, file)

Processing mail for despatch may include:

- calculating and paying for postage
- registering mail
- DX mail

Records of outgoing mail may include:

- date of despatch
- sender
- sender's department
- addressee/organisation
- appropriate carrier (courier, normal mail, express post)
- reference number
- receipts attached where appropriate

Delivery options may include:

- express mail
- overnight bag
- courier

Range Statement

Best option may be determined by:

- cost
- time constraints
- delivery location
- nature of contents (bulky, fragile, confidential)
- quantity of delivery items

Distribution lists may include:

- electronic address books
- database or spreadsheet records
- wordprocessing tables or data files

Maintenance of distribution lists may include:

- deleting records
- adding new records
- updating records or deleting returned mail addressees

Checking electronic mail for accuracy may include:

- spelling
- grammar
- punctuation
- intended meaning

Preparing attachments may include:

- checking that the file size will negotiate the Internet Service Provider gateway
- separating large documents into a number of files
- compressing files
- preparing self-executable files

Evidence Guide

The Evidence Guide identifies the critical aspects, knowledge and skills to be demonstrated to confirm competency for this unit. This is an integral part of the assessment of competency and should be read in conjunction with the Range Statement.

Critical Aspects of Evidence

- Integrated demonstration of all elements of competency and their performance criteria
- Knowledge of the organisation's policies and procedures relating to mail and electronic mail
- Justification for choice of carrier for urgent and same day deliveries
- Knowledge of carriers' requirements (eg postal and courier)

Underpinning Knowledge*

* At this level the learner must demonstrate basic operational knowledge in a moderate range of areas.

- The relevant legislation from all levels of government that affects business operation, especially in regard to Occupational Health and Safety and environmental issues, equal opportunity, industrial relations and anti-discrimination
- Organisational structure
- Titles, roles and locations of the organisation's personnel
- Range of mail services available
- Procedural requirements for receiving/despatching and prioritising correspondence
- Organisational policies and procedures that are specific to handling electronic mail

Underpinning Skills

- Literacy skills to keep records, check accuracy of written material and follow policies and procedures
- Numeracy skills for checking weights and addresses, sorting and collating and estimating time for mail despatches and bulk mailouts
- Communication skills to receive instructions of several steps to complete task, give information to others and consult with or question supervisor and peers to clarify information
- Computer/technology skills related to using electronic mail
- Problem solving eg choosing appropriate delivery method for urgent documents
- Ability to relate to people from a range of social, cultural and ethnic backgrounds and physical and mental abilities

Evidence Guide

Resource Implications

The learner and trainer should have access to appropriate documentation and resources normally used in the workplace

Consistency of Performance

In order to achieve consistency of performance, evidence should be collected over a set period of time which is sufficient to include dealings with an appropriate range and variety of situations

Context/s of Assessment

- Competency is demonstrated by performance of all stated criteria, including paying particular attention to the critical aspects and the knowledge and skills elaborated in the Evidence Guide, and within the scope as defined by the Range Statement
- Assessment must take account of the endorsed assessment guidelines in the Business Services Training Package
- Assessment of performance requirements in this unit should be undertaken in an actual workplace or simulated environment
- Assessment should reinforce the integration of the key competencies and the Business Services Common Competencies for the particular AQF Level. Refer to the Key Competency Levels at the end of this unit

Key Competency Levels

NB: These levels do not relate to the Australian Qualifications Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Collect, analyse and organise information	Communicate ideas and information	Plan and organise activities	Work with others and in teams	Use mathematical ideas and techniques	Solve problems	Use technology
Level 1	Level 1	Level 1	Level 1	Level 1	Level 1	Level 1

Three levels of performance denote level of competency required to perform a task.

1. Perform 2. Administer 3. Design

- **Collecting, analysing and organising information** – to deal with incoming and outgoing mail
- **Communicating ideas and information** – when organising couriers or other carriers
- **Planning and organising activities** – to organise bulk mail despatch either electronically or paper-based
- **Working with teams and others** – to collect and distribute mail
- **Using mathematical ideas and techniques** – to estimate time and resources needed for bulk mailing
- **Solving problems** – to identify the most appropriate and cost efficient option for urgent delivery
- **Using technology** – to record incoming and outgoing mail if required

Please refer to the Assessment Guidelines for advice on how to use the Key Competencies

BSBCMN213A Produce simple wordprocessed documents

Unit Descriptor

This unit covers preparation and production of short routine letters, notes, memos and records using word processing software.

This unit is related to BSBCMN107A Operate a personal computer, BSBCMN108A Develop keyboard skills and BSBCMN306A Produce business documents.

Competency Field

Common

Element

Performance Criteria

- | | |
|----------------------------------|--|
| 1. Use safe work practices | 1.1 Workspace, furniture and equipment are adjusted to suit the <i>ergonomic requirements</i> of the user |
| | 1.2 <i>Work organisation</i> meets organisational and Occupational Health and Safety requirements for computer operation |
| | 1.3 Energy and resource <i>conservation techniques</i> are used to minimise wastage in accordance with organisational and statutory requirements |
| 2. Confirm document requirements | 2.1 Document purpose, audience and presentation requirements are clarified with relevant personnel in accordance with organisational policy and procedures |
| | 2.2 Organisational requirements in relation to <i>document</i> style, storage and security requirements are identified |
| 3. Produce documents | 3.1 Text is entered, checked and amended in accordance with organisational and task requirements |
| | 3.2 <i>Software functions</i> are utilised for consistency of design and layout and document is <i>formatted</i> in accordance with organisational style and presentation requirements |
| | 3.3 Manuals, user documentation and on-line help are used to overcome problems with document presentation and production |
| | 3.4 Mailable document is previewed, adjusted and printed in accordance with organisational and task requirements |
| | 3.5 Documents are prepared within designated timelines, organisational requirements and Australian standards for speed and accuracy |
| | 3.6 Document is named and stored, in accordance with organisational requirements and the application exited without information loss/damage |

Range Statement

The Range Statement provides advice to interpret the scope and context of this unit of competency, allowing for differences between enterprises and workplaces. It relates to the unit as a whole and facilitates holistic assessment. The following variables may be present for this particular unit:

Legislation, codes and national standards relevant to the workplace may include:

- award and enterprise agreements and relevant industrial instruments
- relevant legislation from all levels of government that affects business operation, especially in regard to Occupational Health and Safety and environmental issues, equal opportunity, industrial relations and anti-discrimination
- relevant industry codes of practice

Organisational policy and procedures may include:

- log-on procedures
- password protection
- storage / location of data
- standard formats
- author's instructions
- use of templates

Ergonomic requirements may include:

- workstation height and layout
- chair height, seat and back adjustment
- footrest
- screen position
- keyboard and mouse position
- document holder
- posture
- avoiding radiation from computer screens
- lighting
- noise minimisation

Work organisation may include:

- mix of repetitive and other activities
- rest periods
- exercise breaks

Range Statement

Conservation techniques may include:

- double-sided paper use
- re-used paper for rough drafts (observing confidentiality requirements)
- disposing of non-confidential waste paper in recycling bins
- utilising power-save options for equipment

Documents may include:

- memos
- faxes
- letters
- standard form letters
- labels
- envelopes
- agendas
- minutes
- briefing papers
- short reports
- simple one-page flyers

Software functions may include:

- default settings
- page setup
- paragraph formatting
- text formatting
- tabs
- line spacing
- page numbers
- headers/footers
- spell check
- grammar check
- indent
- document protection

Range Statement

Formatting may include:

- page orientation
- margins
- company logo / letterhead
- columns
- enhancements to text – colour, size, orientation
- enhancements to format – borders, patterns and colours
- alignment on page
- headers/footers

Designated timelines may include:

- timeline agreed with supervisor/person requiring document/s
- timeline agreed with internal/external client
- organisation timeline eg deadline requirements

Printing may include:

- printer setup whole document
- specified pages
- odd or even pages
- multiple copies

Naming and storage of documents may include:

- file names which are easily identifiable in relation to the content
- file/directory names which identify the operator, author, section, date etc
- file names according to organisational procedure eg numbers rather than names
- storage in folders / sub-folders
- storage on hard/floppy disk drives, CD ROM, tape backup
- organisation policy for backing up files
- organisation policy for filing hard copies of documents
- filing locations
- security
- authorised access

Metal and Engineering Training Package

BSBCMN213A Produce Simple Wordprocessed Documents

Range Statement

Checking may include:

- proofreading
- accuracy of information
- spelling, electronically and manually
- grammar
- consistency of layout
- ensuring instructions with regard to content and format have been followed

Evidence Guide

The Evidence Guide identifies the critical aspects, knowledge and skills to be demonstrated to confirm competency for this unit. This is an integral part of the assessment of competency and should be read in conjunction with the Range Statement.

Critical Aspects of Evidence

- Integrated demonstration of all elements of competency and their performance criteria
- Knowledge of simple word processing functions
- Knowledge of standard document layout
- Knowledge of simple document design principles
- Knowledge of organisational requirements for simple wordprocessed documents

Underpinning Knowledge*

* At this level the learner must demonstrate basic operational knowledge in a moderate range of areas.

- The relevant legislation from all levels of government that affects business operation, especially in regard to Occupational Health and Safety and environmental issues, equal opportunity, industrial relations and anti-discrimination
- Knowledge of the purposes of and the uses and function of wordprocessing software.
- Organisational requirements for ergonomics, work periods and breaks, and conservation techniques.
- Formatting styles and rules of the organisation's style guide
- Effect of formatting on readability and appearance of documents

Underpinning Skills

- Keyboarding and technology skills
- Literacy skills for reading and understanding the organisation's procedures; using basic models to produce a range of correspondence; using page layout to support text structure
- Proofreading and editing skills for checking own work and re-reading for accuracy against original
- Communication including questioning and clarifying
- Problem solving skills to solve routine problems
- Ability to relate to people from a range of social, cultural and ethnic backgrounds and physical and mental abilities

Evidence Guide

Consistency of Performance In order to achieve consistency of performance, evidence should be collected over a set period of time which is sufficient to include dealings with an appropriate range and variety of situations

Resource Implications The learner and trainer should have access to appropriate documentation and resources normally used in the workplace. These may include:

- workplace reference materials such as style guides
- computer equipment with wordprocessing software
- English dictionary

Context/s of Assessment

- Competency is demonstrated by performance of all stated criteria, including paying particular attention to the critical aspects and the knowledge and skills elaborated in the Evidence Guide, and within the scope as defined by the Range Statement
- Assessment must take account of the endorsed assessment guidelines in the Business Services Training Package
- Assessment of performance requirements in this unit should be undertaken in an actual workplace or simulated environment
- Assessment should reinforce the integration of the key competencies and the Business Services Common Competencies for the particular AQF Level. Refer to the Key Competency Levels at the end of this unit

Key Competency Levels

NB: These levels do not relate to the Australian Qualifications Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Collect, analyse and organise information	Communicate ideas and information	Plan and organise activities	Work with others and in teams	Use mathematical ideas and techniques	Solve problems	Use technology
Level 2	Level 2	Level 2	Level 2	Level 2	Level 2	Level 2

Three levels of performance denote level of competency required to perform a task.

1. Perform 2. Administer 3. Design

- **Collecting, analysing and organising information** – to meet organisational requirements
- **Communicating ideas and information** – through well-designed business documents
- **Planning and organising activities** – to meet designated timelines
- **Working with teams and others** – to determine document purpose and audience
- **Using mathematical ideas and techniques** – to determine spatial design requirements
- **Solving problems** – using manuals and on-line help
- **Using technology** – to produce wordprocessing documents

Please refer to the Assessment Guidelines for advice on how to use the Key Competencies

BSBCMN302A Organise personal work priorities and development

Unit Descriptor

This unit covers the skills and knowledge required to organise own work schedules, monitor and obtain feedback on work performance, and maintain required levels of competence.

This unit is related to BSBCMN202A Organise and complete daily work tasks and BSBCMN402A Develop work priorities.

Competency Field

Common

Element

Performance Criteria

- | | |
|--|---|
| 1. Organise and complete own work schedule | 1.1 <i>Work goals and objectives</i> are understood, negotiated and agreed in accordance with <i>organisational requirements</i> |
| | 1.2 Workload is assessed and prioritised to ensure completion within identified timeframes |
| | 1.3 <i>Factors</i> affecting the achievement of work objectives are identified and incorporated into work plans |
| | 1.4 <i>Business technology</i> is used efficiently and effectively to manage and monitor scheduling and completion of tasks |
| 2. Monitor own work performance | 2.1 Personal work performance is accurately monitored and adjusted to ensure maintenance of job quality and customer service |
| | 2.2 <i>Feedback on performance</i> is actively sought from colleagues and clients and evaluated in the context of individual and group requirements |
| | 2.3 Variations in the quality of service and products are routinely identified and reported in accordance with organisational requirements |
| 3. Develop and maintain own competence level | 3.1 Personal knowledge and skills are assessed against <i>competency standards</i> performance descriptions to determine development needs and priorities |
| | 3.2 <i>Opportunities for improvement</i> are identified and planned in liaison with colleagues |
| | 3.3 Feedback is used to identify and develop ways to improve competence within available opportunities |
| | 3.4 New skills and opportunities to develop them are identified to achieve and maintain continuous learning |

Element

Performance Criteria

- 3.5 Records and documents relating to achievements and assessments are stored and maintained in accordance with own requirements

Range Statement

The Range Statement provides advice to interpret the scope and context of this unit of competence, allowing for differences between enterprises and workplaces. It relates to the unit as a whole and facilitates holistic assessment. The following variables may be present for this particular unit:

They may use legislation, codes and national standards relevant to the workplace including:

- award and enterprise agreements and relevant industrial instruments
- relevant legislation from all levels of government that affects business operation, especially in regard to Occupational Health and Safety and environmental issues, equal opportunity, industrial relations and anti-discrimination
- relevant industry codes of practice

Work goals and objectives may include:

- sales targets
- reporting deadlines
- production targets
- budgetary targets
- team participation
- team and individual learning goals

Organisational requirements may be included in:

- quality assurance and/or procedures manuals
- goals, objectives, plans, systems and processes
- legal and organisational policy/guidelines and requirements
- business and performance plans
- access and equity principles and practice
- ethical standards
- Occupational Health and Safety policies, procedures and programs
- quality and continuous improvement processes and standards
- defined resource parameters

Range Statement

Factors affecting the achievement of work objectives may include:

- competing work demands
- technology/equipment breakdowns
- unforeseen incidents
- workplace hazards, risks and controls
- environmental factors such as time, weather, etc
- resource and materials availability
- budget constraints

Business technology may include:

- computers
- computer applications
- modems
- personal schedulers
- email
- internet/extranet/intranet
- photocopiers
- scanners
- facsimile machines
- printers

Feedback on performance may include:

- formal/informal performance appraisals
- obtaining feedback from supervisors and colleagues
- obtaining feedback from clients
- personal, reflective behaviour strategies
- routine organisational methods for monitoring service delivery

Competency standards are standards which measure:

- all those personal and technical knowledge, skills and attitudinal aspects (competencies) required to effectively and efficiently undertake the day to day tasks and duties of the practitioner's work function

Range Statement

Opportunities for improvement may include:

- coaching, mentoring and/or supervision
- formal/informal learning programs
- internal/external training provision
- work experience/exchange/opportunities
- personal study
- career planning/development
- performance appraisals
- workplace skills assessment
- quality assurance assessments and recommendations
- Recognition of Prior Learning

Evidence Guide

The Evidence Guide identifies the critical aspects, underpinning knowledge and skills to be demonstrated to confirm competence for this unit. This is an integral part of the assessment of competence and should be read in conjunction with the Range Statement.

Critical Aspects of Evidence

- Preparing work plans
- Prioritising and scheduling work objectives and tasks
- Seeking and acting on feedback from clients and colleagues
- Reviewing own work performance against achievements through self-assessment
- Accessing learning opportunities to extend own personal work competencies

Underpinning Knowledge*

* At this level the learner must demonstrate some relevant theoretical knowledge.

- The relevant legislation from all levels of government that affects business operation, especially in regard to Occupational Health and Safety and environmental issues, equal opportunity, industrial relations and anti-discrimination
- Understanding the organisation's policies, plans and procedures
- Knowledge of methods to elicit, analyse and interpret feedback
- Understanding techniques to prepare personal plans and establish priorities
- Knowledge of the principles and techniques of goal setting, measuring performance, time management and personal assessment
- Understanding processes to interpret competency standards and apply them to self
- Understanding methods to identify and prioritise

Evidence Guide

personal learning needs

Underpinning Skills

- Literacy skills for reading and understanding the organisation's procedures, own work goals and objectives
- Proofreading and editing skills for checking own work
- Planning skills to organise work priorities and arrangements
- Problem solving skills to solve routine problems
- Communication skills including giving and receiving constructive feedback on development needs
- Technology skills including the ability to select and use technology appropriate to a task
- Ability to relate to people from a range of social, cultural and ethnic backgrounds and physical and mental abilities

Resource Implications

The learner and trainer should have access to appropriate documentation and resources normally used in the workplace

Consistency of Performance

In order to achieve consistency of performance, evidence should be collected over a set period of time which is sufficient to include dealings with an appropriate range and variety of situations

Context/s of Assessment

- Competency is demonstrated by performance of all stated criteria, including paying particular attention to the critical aspects and the knowledge and skills elaborated in the Evidence Guide, and within the scope as defined by the Range Statement
- Assessment must take account of the endorsed assessment guidelines in the Business Services Training Package
- Assessment of performance requirements in this unit should be undertaken in an actual workplace or simulated environment
- Assessment should reinforce the integration of the key competencies and the Business Services Common Competencies for the particular AQF Level. Refer to the Key Competency Levels at the end of this unit

Key Competency Levels

NB: These levels do not relate to the Australian Qualifications Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Collect, analyse and organise information	Communicate ideas and information	Plan and organise activities	Work with others and in teams	Use mathematical ideas and techniques	Solve problems	Use technology
Level 2	Level 1	Level 2	Level 2	Level 1	Level 2	Level 2

Three levels of performance denote level of competency required to perform a task.

1. Perform 2. Administer 3. Design

- **Collecting, analysing and organising information** – to measure self-performance
- Communicating ideas and information – with members of the work team
- **Planning and organising activities** – for self
- **Working with teams and others** – in completing scheduled tasks
- **Using mathematical ideas and techniques** – as an aid to measure and schedule tasks
- **Solving problems** – as an aid to self-development
- **Using technology** – to manage scheduling and completion of tasks

Please refer to the Assessment Guidelines for advice on how to use the Key Competencies

BSBCMN306A Produce business documents

Unit Descriptor This unit covers the skills and knowledge required to produce various business documents. It includes the skills and knowledge required to select and use a range of functions on a computer application.

This unit relates to BSBCMN213A Produce simple wordprocessed documents and BSBCMN405A Analyse and present research information. Consider co-assessment with BSBCMN305A Organise workplace information.

Competency Field Common

Element

Performance Criteria

- | | |
|---------------------------------|---|
| 1. Select and prepare resources | 1.1 Appropriate <i>technology</i> and <i>software</i> applications are selected and utilised to produce required <i>business documents</i> |
| | 1.2 <i>Organisational requirements</i> for information entry, storage, output and quality of presentation are identified prior to design of documentation |
| | 1.3 Workspace, furniture and equipment are adjusted to suit the ergonomic requirements of the user |
| 2. Design document | 2.1 Document design is appropriate for the efficient entry of information and maximises the presentation and appearance of information |
| | 2.2 Files and records are identified, opened, generated and amended according to task and organisational requirements |
| | 2.3 A range of <i>functions</i> are used to ensure consistency of design and layout |
| | 2.4 <i>Input devices</i> are operated within designated speed and accuracy requirements |
| 3. Produce document | 3.1 Document production is completed within designated timelines according to organisational requirements |
| | 3.2 Documents produced are checked to ensure they meet task requirements for style and layout |
| | 3.3 <i>Storage of documents</i> is appropriate and applications are exited without damage to or loss of information |
| | 3.4 Manuals, training booklets and/or help-desks are used to overcome basic difficulties with document design and production |

Range Statement

The Range Statement provides advice to interpret the scope and context of this unit of competency, allowing for differences between enterprises and workplaces. It relates to the unit as a whole and facilitates holistic assessment. The following variables may be present for this particular unit:

Legislation, codes and national standards relevant to the workplace which may include:

- award and enterprise agreements and relevant industrial instruments
- relevant legislation from all levels of government that affects business operation, especially in regard to Occupational Health and Safety and environmental issues, equal opportunity, industrial relations and anti-discrimination
- relevant industry codes of practice

Technology may include:

- computers
- scanners
- photocopiers
- printers

Software (a minimum of three packages) may include:

- word processing packages
- spreadsheet packages
- database packages
- accounting packages
- presentation packages

Business documents may include:

- newsletters
- client databases
- proposals
- reports
- accounts statements
- project reviews
- web pages

Range Statement

Organisational requirements may include:

- quality assurances and/or procedures manuals
- log-on procedures
- legal and organisational policy/guidelines and requirements
- correctly identifying and opening files
- locating data
- budgets
- Occupational Health and Safety policies, procedures and programs
- security
- saving and closing files
- storing data
- manufacturer's guidelines

Functions used when designing a document may include:

- using styles
- merging documents
- table formatting
- using columns
- spell checking
- editing
- alternating headers and footers

Input devices may include:

- keyboard
- numerical key pad
- mouse
- scanner

Storage of documents may include:

- storage in directories and sub-directories
- storage on CD-ROMs, disk drives or back up systems
- storage/filing of hard copies of computer generated documents
- storage/filing of hard copies of incoming and outgoing facsimiles
- storage/filing of incoming and outgoing correspondence

Evidence Guide

The Evidence Guide identifies the critical aspects, underpinning knowledge and skills to be demonstrated to confirm competency for this unit. This is an integral part of the assessment of competency and should be read in conjunction with the Range Statement.

Critical Aspects of Evidence

- Selecting and applying appropriate technology and software
- Designing and producing business documents using a minimum of three software applications
- Using of a range of functions which enhance the presentation and readability of the document
- Applying OHS procedures for set up of workstation and operation of computer
- Using data storage options

Underpinning Knowledge*

* At this level the learner must demonstrate some relevant theoretical knowledge.

- The relevant legislation from all levels of government that affects business operation, especially in regard to Occupational Health and Safety and environmental issues, equal opportunity, industrial relations and anti-discrimination
- Understanding the organisation's policies, plans and procedures
- Understanding the functions and features of contemporary computer applications
- Techniques and methods used to check accuracy
- Understanding how to select appropriate technology for production requirements
- Knowledge of organisational requirements for document design eg. style guide

Underpinning Skills

- Literacy skills to read and understand a variety of texts; prepare general information and papers according to target audience; spell with accuracy; use grammar and punctuation effectively as an aid to understanding
- Proofreading and editing skills to ensure clarity of meaning and conformity to organisational requirements, check for accuracy and consistency of information
- Problem solving skills to determine document design and production processes
- Numeracy skills to access and retrieve data
- Keyboarding and computer skills to complete a range of formatting and layout tasks

Evidence Guide

- Ability to relate to people from a range of social, cultural and ethnic backgrounds and physical and mental abilities

Resource Implications

The learner and trainer should have access to appropriate documentation and resources normally used in the workplace

Consistency of Performance

In order to achieve consistency of performance, evidence should be collected over a set period of time which is sufficient to include dealings with an appropriate range and variety of situations

Context/s of Assessment

- Competency is demonstrated by performance of all stated criteria, including paying particular attention to the critical aspects and the knowledge and skills elaborated in the Evidence Guide, and within the scope as defined by the Range Statement
- Assessment must take account of the endorsed assessment guidelines in the Business Services Training Package
- Assessment of performance requirements in this unit should be undertaken in an actual workplace or simulated environment
- Assessment should reinforce the integration of the key competencies and the Business Services Common Competencies for the particular AQF Level. Refer to the Key Competency Levels at the end of this unit

Key Competency Levels

NB: These levels do not relate to the Australian Qualifications Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Collect, analyse and organise information	Communicate ideas and information	Plan and organise activities	Work with others and in teams	Use mathematical ideas and techniques	Solve problems	Use technology
Level 2	Level 2	Level 2	Level 1	Level 1	Level 1	Level 2

Three levels of performance denote level of competency required to perform a task.

1. Perform 2. Administer 3. Design

- **Collecting, analysing and organising information** – to design document layout
- **Communicating ideas and information** – through appropriate presentation and format of documents
- **Planning and organising activities** – for self
- **Working with teams and others** – in completing scheduled tasks
- **Using mathematical ideas and techniques** – as an aid to checking accuracy
- **Solving problems** – to identify application problems
- **Using technology** – to complete allocated tasks

Please refer to the Assessment Guidelines for advice on how to use the Key Competencies

BSBCMN308A Maintain financial records

Unit Descriptor This unit covers the maintenance of financial records for a business. It includes activities such as the maintenance of daily financial records, including reconciling debtors' and creditors' systems and preparing a maintaining a general ledger and preparing a trial balance. It also includes activities associated with the monitoring of cash control for accounting purposes.

This unit is related to BSBCMN207A Prepare and process financial/business documents and BSBCMN408A Report on financial activity.

Competency Field Common

Element	Performance Criteria
1. Maintain daily financial records	<p>1.1 Daily financial records are maintained correctly and in accordance with <i>organisational requirements</i> for accounting purposes</p> <p>1.2 <i>Discrepancies</i> or errors in <i>documentation</i> or transactions are identified and rectified or referred to <i>designated persons</i> in accordance with organisational requirements</p> <p>1.3 Credit and debit transactions are accurately and promptly entered into <i>journals</i> in accordance with organisational requirements</p>
2. Maintain general ledger	<p>2.1 General ledger is maintained in accordance with organisational requirements</p> <p>2.2 <i>Transactions</i> are posted into the general ledger in accordance with organisational reporting requirements</p> <p>2.3 <i>Debtors' and creditors' systems</i> are reconciled with general ledger</p> <p>2.4 Trial balance is accurately prepared from general ledger in accordance with organisational requirements</p>
3. Monitor cash control	<p>3.1 Cash flow is accurately accounted for in accordance with organisational requirements</p> <p>3.2 <i>Payments</i> are made and received in accordance with organisational requirements</p> <p>3.3 Outstanding accounts are collected or followed up within designated timelines</p> <p>3.4 Payment documentation is checked for accuracy of information and despatched to creditors within <i>designated timeline</i></p>

Range Statement

The Range Statement provides advice to interpret the scope and context of this unit of competency, allowing for differences between enterprises and workplaces. It relates to the unit as a whole and facilitates holistic assessment. The following variables may be present for this particular unit:

- Legislation, codes and national standards relevant to the workplace which may include:**
- award and enterprise agreements and relevant industrial instruments
 - relevant legislation from all levels of government that affects business operation, especially in regard to Occupational Health and Safety and environmental issues, equal opportunity, industrial relations and anti-discrimination
 - relevant industry codes of practice

- Organisational requirements may include:**
- quality assurances and/or procedures manuals
 - procedures for totalling adjusted journals
 - resolution procedures
 - legal and organisational policy/guidelines and requirements
 - security procedures
 - Occupational Health and Safety policies, procedures and programs
 - guidelines for reconciling journals
 - Australian accounting and auditing standards
 - designated timelines

- Discrepancies may relate to:**
- bank charges
 - interest
 - dishonoured cheques
 - errors in transposing between source documents and journals

- Documentation may include:**
- sales invoices
 - purchase invoices
 - sales credit notes
 - purchase credit notes

Range Statement

Designated persons may include:

- supervisor
- bank
- organisation's authorisations department
- line management
- statutory body

Journals may include:

- sales and sales returns
- cash receipts
- purchases and purchase returns
- cash payments

Transactions may include:

- purchase of a fixed asset on credit
- sale of a fixed asset on credit
- correction of posting errors
- write-off a bad debt
- interest expense
- interest receivable
- commencing business entries
- withdrawal of stock/assets by owner
- non-cash transactions (eg writing off depreciation, stock losses)

Reconciling debtors'/creditors' systems may include:

- checking accuracy of debtor account balances (eg cash receipts journal, sales return journal, general journal)
- checking accuracy of creditor account balances (eg cash payments journal, purchases journal, purchases returns journal, general journal)
- checking the total of the debtor's schedule equals the balance of the debtor's control account
- checking the total of the creditor's schedule equals the balance of the creditor's control account

Payments may include:

- cheque
- credit card
- cash
- direct debit

Metal and Engineering Training Package

BSBCMN308A Maintain Financial Records

Range Statement

Designated timelines may specify:

- within agreed period
- monthly
- by month end
- within organisational deadline

Evidence Guide

The Evidence Guide identifies the critical aspects, underpinning knowledge and skills to be demonstrated to confirm competency for this unit. This is an integral part of the assessment of competency and should be read in conjunction with the Range Statement.

Critical Aspects of Evidence

- Identifying and responding to discrepancies and errors
- Transferring and recording financial data accurately
- Identifying and complying with organisational requirements
- Reconciling expenditures and revenue
- Recommending options for financial decision making

Underpinning Knowledge*

* At this level the learner must demonstrate some relevant theoretical knowledge.

- The relevant legislation from all levels of government that affects business operation, especially in regard to Occupational Health and Safety and environmental issues, equal opportunity, industrial relations and anti-discrimination
- Knowledge of organisational policies and procedures relating to maintaining financial records
- Understanding processes to identify relevant source documents and information contained within source documents
- Understanding of the importance of a general ledger chart of accounts in relation to maintain and reporting financial data
- Understanding the definition of credits/creditors and debits/debtors
- Principles of double entry bookkeeping and accrual accounting
- Understanding methods of presenting financial data
- Knowledge of financial legislation references and information
- Understanding practices to include ethical considerations in all areas of work

Evidence Guide

Underpinning Skills

- Literacy skills to identify financial information; to read and understand the organisation's accounting procedures
- Proofreading and editing skills to ensure conformity to organisational requirements, check for accuracy and consistency of information
- Communication skills to clarify information and refer errors or discrepancies to appropriate people
- Numeracy skills to reconcile figures; prepare cash analysis sheets
- Analysis skills to read and interpret financial data
- Problem solving skills for a defined range of problems
- Ability to relate to people from a range of social, cultural and ethnic backgrounds and physical and mental abilities

Resource Implications

The learner and trainer should have access to appropriate documentation and resources normally used in the workplace

Consistency of Performance

In order to achieve consistency of performance, evidence should be collected over a set period of time which is sufficient to include dealings with an appropriate range and variety of situations

Context/s of Assessment

- Competency is demonstrated by performance of all stated criteria, including paying particular attention to the critical aspects and the knowledge and skills elaborated in the Evidence Guide, and within the scope as defined by the Range Statement
- Assessment must take account of the endorsed assessment guidelines in the Business Services Training Package
- Assessment of performance requirements in this unit should be undertaken in an actual workplace or simulated environment
- Assessment should reinforce the integration of the key competencies and the Business Services Common Competencies for the particular AQF Level. Refer to the Key Competency Levels at the end of this unit

Key Competency Levels

NB: These levels do not relate to the Australian Qualifications Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Collect, analyse and organise information	Communicate ideas and information	Plan and organise activities	Work with others and in teams	Use mathematical ideas and techniques	Solve problems	Use technology
Level 2	Level 2	Level 2	Level 1	Level 2	Level 1	Level 2

Three levels of performance denote level of competency required to perform a task.

1. Perform 2. Administer 3. Design

- **Collecting, analysing and organising information** – to process financial documentation
- **Communicating ideas and information** – with members of the work team
- **Planning and organising activities** – for payment of invoices etc within designated timeframes
- **Working with teams and others** – in completing scheduled tasks
- **Using mathematical ideas and techniques** – in reconciling financial documents
- **Solving problems** – to identify discrepancies and errors
- **Using technology** – to complete allocated tasks

Please refer to the Assessment Guidelines for advice on how to use the Key Competencies

BSBCM402A Develop work priorities

Unit Descriptor This unit covers the skills and knowledge required to plan own work schedules, monitor and obtain feedback on work performance and development.

This unit is related to BSBCM302A Organise personal work priorities and development.

Competency Field Common

Element	Performance Criteria
1. Plan and complete own work schedule	<p>1.1 <i>Workgroup</i> plans are prepared to reflect consideration of resources, client needs and workgroup targets</p> <p>1.2 <i>Work objectives</i> and priorities are analysed and incorporated into personal schedules and responsibilities</p> <p>1.3 <i>Factors</i> affecting the achievement of work objectives are identified and contingencies established and incorporated into work plans</p> <p>1.4 <i>Business technology</i> is used efficiently and effectively to manage and monitor planning completion and scheduling of tasks</p>
2. Monitor own work performance	<p>2.1 Personal performance standards are identified and analysed through self-assessment and feedback from others on the achievement of work objectives</p> <p>2.2 <i>Feedback on performance</i> is actively sought from colleagues and clients and evaluated in context of individual and group requirements</p> <p>2.3 Variations in the quality of service and products are routinely identified and reported in accordance with <i>organisational requirements</i></p>
3. Coordinate professional development	<p>3.1 Personal knowledge and skills are assessed against <i>competency standards</i> performance descriptions to determine development needs and priorities</p> <p>3.2 Opportunities for improvement and sources of learning are researched and planned in liaison with colleagues</p> <p>3.3 <i>Feedback</i> is used to identify and develop ways to improve competence within available opportunities</p> <p>3.4 New skills are identified and <i>professional development activities</i> are accessed and completed to facilitate continuous learning and career development</p>

Element

Performance Criteria

- 3.5 Records and documents relating to achievements and assessments are stored and maintained in accordance with organisational requirements

Range Statement

The Range Statement provides advice to interpret the scope and context of this unit of competence, allowing for differences between enterprises and workplaces. It relates to the unit as a whole and facilitates holistic assessment. The following variables may be present for this particular unit:

They may use legislation, codes and national standards relevant to the workplace including:

- award and enterprise agreements and relevant industrial instruments
- relevant legislation from all levels of government that affects business operation, especially in regard to Occupational Health and Safety and environmental issues, equal opportunity, industrial relations and anti-discrimination
- relevant industry codes of practice

Workgroup plans may include:

- sales plans
- reporting plans
- production plans
- budgetary plans
- team participation
- work schedules
- team and individual learning goals

Work objectives may include:

- sales targets
- reporting deadlines
- production targets
- budgetary targets
- team participation
- team and individual learning goals

Factors affecting the achievement of work objectives may include:

- competing work demands
- technology/equipment breakdowns
- unforeseen incidents
- personnel
- environmental factors such as time, weather, etc
- resource and materials availability
- budget constraints

Range Statement

Business technology may include:

- computers
- computer applications
- personal schedules
- modems
- scanners
- email and internet/intranet/extranet
- photocopiers
- facsimile machines
- printers

Feedback on performance may include:

- formal/informal performance appraisals
- obtaining comments from supervisors and colleagues
- obtaining comments from clients
- personal, reflective behaviour strategies
- routine organisational methods for monitoring service delivery

Organisational requirements may be included in:

- quality assurances and/or procedures manuals
- goals, objectives, plans, systems and processes
- legal and organisational policy/guidelines and requirements
- business and performance plans
- access and equity principles and practice
- ethical standards
- Occupational Health and Safety policies, procedures and programs
- quality and continuous improvement processes and standards
- defined resource parameters

Competency standards are standards which measure:

- all those personal and technical knowledge, skills and attitudinal aspects (competencies) required to effectively and efficiently undertake the day to day tasks and duties of the practitioner's work function

Range Statement

Professional development activities may include:

- coaching, mentoring and/or supervision
- formal/informal learning programs
- internal/external training provision
- work experience/exchange/opportunities
- personal study
- career planning/development
- performance appraisals
- workplace skills assessment
- Recognition of Prior Learning

Evidence Guide

The Evidence Guide identifies the critical aspects, underpinning knowledge and skills to be demonstrated to confirm competence for this unit. This is an integral part of the assessment of competence and should be read in conjunction with the Range Statement.

Critical Aspects of Evidence

- Preparing and communicating work plans
- Scheduling work objectives and tasks to support the achievement of goals
- Seeking and acting on feedback from clients and colleagues
- Reviewing own work performance against achievements through self-assessment
- Accessing learning opportunities to extend own personal work competencies
- Using business technology to monitor self development

Underpinning Knowledge*

* At this level the learner must demonstrate understanding of a broad knowledge base incorporating some theoretical concepts.

- The relevant legislation from all levels of government that affects business operation, especially in regard to Occupational Health and Safety and environmental issues, equal opportunity, industrial relations and anti-discrimination
- Understanding the organisation's policies, plans and procedures
- Understanding of methods to elicit, analyse and interpret feedback
- Knowledge of techniques to prepare personal plans and establish priorities
- Knowledge of quality standards for products and services
- Knowledge of relevant business technology applications

Evidence Guide

- Understanding of methods to evaluate own performance
- Processes to interpret competency standards and apply them to self
- Methods to identify and prioritise personal learning needs
- Understanding range of professional development activities and criteria to apply in choosing between them

Underpinning Skills

- Literacy skills to understand the organisation's policies and procedures; interpret competency standards; use a variety of strategies for planning and reviewing own work
- Problem solving skills to develop contingency plans
- Evaluation skills for assessing outcomes
- Communication skills including giving and receiving constructive feedback on development needs
- Technology skills including the ability to select and use technology appropriate to a task
- Time management skills to complete tasks within agreed timeframes
- Observation skills for identifying opportunities for learning and development
- Participation skills for integrating as a member of a work team
- Ability to relate to people from a range of social, cultural and ethnic backgrounds and physical and mental abilities

Resource Implications

The learner and trainer should have access to appropriate documentation and resources normally used in the workplace

Consistency of Performance

In order to achieve consistency of performance, evidence should be collected over a set period of time which is sufficient to include dealings with an appropriate range and variety of situations

Context/s of Assessment

- Competency is demonstrated by performance of all stated criteria, including paying particular attention to the critical aspects and the knowledge and skills elaborated in the Evidence Guide, and within the scope as defined by the Range Statement
- Assessment must take account of the endorsed

Evidence Guide

assessment guidelines in the Business Services Training Package

- Assessment of performance requirements in this unit should be undertaken in an actual workplace or simulated environment
- Assessment should reinforce the integration of the key competencies and the Business Services Common Competencies for the particular AQF Level. Refer to the Key Competency Levels at the end of this unit

Key Competency Levels

NB: These levels do not relate to the Australian Qualifications Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Collect, analyse and organise information	Communicate ideas and information	Plan and organise activities	Work with others and in teams	Use mathematical ideas and techniques	Solve problems	Use technology
Level 2	Level 2	Level 2	Level 2	Level 1	Level 2	Level 2

Three levels of performance denote level of competency required to perform a task.

1. Perform 2. Administer 3. Design

- **Collecting, analysing and organising information** – to measure self-performance
- **Communicating ideas and information** – with members of the work team
- **Planning and organising activities** – for self
- **Working with teams and others** – in completing scheduled tasks
- **Using mathematical ideas and techniques** – as an aid to measure and schedule tasks
- **Solving problems** – as an aid to self-development
- **Using technology** – to manage scheduling and completion of tasks

Please refer to the Assessment Guidelines for advice on how to use the Key Competencies

BSBCMN404A Develop teams and individuals

Unit Descriptor This unit covers the skills and knowledge required to determine individual and team development needs and facilitate the development of the workgroup.

This unit is related to BSBCMN304A Contribute to personal skill development and learning.

Competency Field Common

Element	Performance Criteria
1. Determine development needs	<p>1.1 <i>Learning and development needs</i> are systematically identified and implemented in line with <i>organisational requirements</i></p> <p>1.2 A learning plan to meet individual and group training and development needs is collaboratively developed, agreed to and implemented</p> <p>1.3 Individuals are encouraged to self evaluate performance and identify areas for improvement</p> <p>1.4 <i>Feedback on performance</i> of team members is collected from relevant sources and compared with established team learning needs</p>
2. Develop individuals and teams	<p>2.1 Learning and development program goals and objectives are identified to match specific knowledge and skill requirements of <i>competency standards</i></p> <p>2.2 <i>Learning delivery methods</i> are appropriate to the learning goals, the learning style of participants, and availability of <i>equipment and resources</i></p> <p>2.3 Workplace learning opportunities and <i>coaching and mentoring assistance</i> are provided to facilitate individual and team achievement of competencies</p> <p>2.4 Development opportunities incorporate a range of activities and support materials appropriate to the achievement of identified competencies</p> <p>2.5 Resources and timelines required for learning activities are identified and approved in accordance with organisational requirements</p>
3. Monitor and evaluate workplace learning	<p>3.1 Feedback from individuals or teams is used to identify and implement improvements in future learning arrangements</p> <p>3.2 Outcomes and performance of individuals/teams are assessed and recorded to determine the effectiveness of development programs and the extent of additional development support</p>

Element

Performance Criteria

- 3.3 Modifications to learning plans are negotiated to improve the efficiency and effectiveness of learning
- 3.4 Records and reports of competency are documented and maintained within organisational requirements

Range Statement

The Range Statement provides advice to interpret the scope and context of this unit of competence, allowing for differences between enterprises and workplaces. It relates to the unit as a whole and facilitates holistic assessment. The following variables may be present for this particular unit:

They may use legislation, codes and national standards relevant to the workplace including:

- award and enterprise agreements and relevant industrial instruments
- relevant legislation from all levels of government that affects business operation, especially in regard to Occupational Health and Safety and environmental issues, equal opportunity, industrial relations and anti-discrimination
- relevant industry codes of practice

Learning and development needs may include:

- coaching, mentoring and/or supervision
- formal/informal learning programs
- internal/external training provision
- work experience/exchange/opportunities
- personal study
- career planning/development
- performance appraisals
- workplace skills assessment
- Recognition of Prior Learning

Range Statement

Organisational requirements may be included in:

- quality assurances and/or procedures manuals
- goals, objectives, plans, systems and processes
- legal and organisational policy/guidelines and requirements
- Occupational Health and Safety policies, procedures and programs
- confidentiality and security requirements
- business and performance plans
- anti-discrimination and related policy
- access and equity principles and practice
- ethical standards
- quality and continuous improvement processes and standards
- defined resource parameters

Feedback on performance may include:

- formal/informal performance appraisals
- obtaining feedback from supervisors and colleagues
- obtaining feedback from clients
- personal, reflective behaviour strategies
- routine organisational methods for monitoring service delivery

Competency standards are standards which measure:

- all those personal and technical knowledge, skills and attitudinal aspects (competencies) required to effectively and efficiently undertake the day to day tasks and duties of the practitioner's work function

Learning delivery methods may include:

- on-the-job coaching or mentoring
- problem solving
- presentations/demonstrations
- formal course participation
- work experience
- involvement in professional networks
- conference and seminar attendance
- induction

Range Statement

Equipment and resources may include:

- funding
- facilities
- guest speakers
- training equipment such as whiteboards and audio-visual equipment
- technological tools and equipment
- time

Coaching and mentoring assistance may include:

- providing feedback to another team member
- fair and ethical practice
- non-discriminatory processes and activities
- respecting the contribution of all participants and giving credit for achievements
- presenting and promoting a positive image of the collective group
- problem solving
- providing encouragement

Evidence Guide

The Evidence Guide identifies the critical aspects, underpinning knowledge and skills to be demonstrated to confirm competence for this unit. This is an integral part of the assessment of competence and should be read in conjunction with the Range Statement.

Critical Aspects of Evidence

- Identifying and implementing learning opportunities for others
- Giving and receiving feedback constructively
- Facilitating participation of individuals in the work of the team
- Negotiating learning plans to improve the effectiveness of learning
- Preparing learning plans to match skill needs
- Accessing and designing learning opportunities

Underpinning Knowledge*

* At this level the learner must demonstrate understanding of a broad knowledge base incorporating some theoretical concepts.

- The relevant legislation from all levels of government that affects business operation, especially in regard to Occupational Health and Safety and environmental issues, equal opportunity, industrial relations and anti-discrimination
- Knowledge of the principles of coaching and mentoring for development of competence
- Understanding how to work effectively with team members who have diverse work styles, aspirations,

Evidence Guide

cultures and perspectives

- Understanding how to facilitate team development and improvement
- Knowledge of the organisation's policies, plans and procedures
- Understanding methods and techniques for eliciting and interpreting feedback
- Understanding methods for identifying and prioritising personal development opportunities and options
- Knowledge of career paths and competency standards in the industry

Underpinning Skills

- Literacy skills to read and understand a variety of texts; prepare general information and papers according to target audience; spell with accuracy; use grammar and punctuation effectively as an aid to understanding; maintain records of learning
- Communication skills including receiving feedback and reporting, maintaining effective relationships and conflict management
- Planning skills to organise required resources and equipment to meet learning needs
- Coaching and mentoring skills to provide support to colleagues
- Report writing skills to organise information; assess information for relevance and accuracy; identify and elaborate on learning outcomes
- Facilitation skills to conduct small group training sessions
- Time management skills for scheduling learning programs within work activities
- Ability to relate to people from a range of social, cultural and ethnic backgrounds and physical and mental abilities

Resource Implications

The learner and trainer should have access to appropriate documentation and resources normally used in the workplace

Consistency of Performance

In order to achieve consistency of performance, evidence should be collected over a set period of time which is sufficient to include dealings with an appropriate range and variety of situations

Evidence Guide

Context/s of Assessment

- Competency is demonstrated by performance of all stated criteria, including paying particular attention to the critical aspects and the knowledge and skills elaborated in the Evidence Guide, and within the scope as defined by the Range Statement
- Assessment must take account of the endorsed assessment guidelines in the Business Services Training Package
- Assessment of performance requirements in this unit should be undertaken in an actual workplace or simulated environment
- Assessment should reinforce the integration of the key competencies and the Business Services Common Competencies for the particular AQF Level. Refer to the Key Competency Levels at the end of this unit

Key Competency Levels

NB: These levels do not relate to the Australian Qualifications Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Collect, analyse and organise information	Communicate ideas and information	Plan and organise activities	Work with others and in teams	Use mathematical ideas and techniques	Solve problems	Use technology
Level 2	Level 2	Level 2	Level 2	Level 2	Level 2	Level 2

Three levels of performance denote level of competency required to perform a task.

1. Perform 2. Administer 3. Design

- **Collecting, analysing and organising information** – to measure team performance
- **Communicating ideas and information** – with members of the work team
- **Planning and organising activities** – for learning opportunities
- **Working with teams and others** – in completing scheduled tasks
- **Using mathematical ideas and techniques** – as an aid to measure learning outcomes
- **Solving problems** – as an aid to team-development
- **Using technology** – to manage scheduling of tasks

Please refer to the Assessment Guidelines for advice on how to use the Key Competencies

BSBCMN406A Maintain business technology

Unit Descriptor This unit covers the skills and knowledge required to maintain the effectiveness of business technology in the workplace. It includes activities such as the maintenance of existing technology and the planning of future technology requirements.

This unit is related to BSBCMN307A Maintain business resources. Consider co-assessment with BSBCMN407A Coordinate business resources.

Competency Field Common

Element	Performance Criteria
1. Maintain performance of hardware and software	<p>1.1 Systems effectiveness is monitored and evaluated to ensure it meets <i>organisational and system requirements</i></p> <p>1.2 Operating system, drive and disk structure, reports and files are used to identify performance problems</p> <p>1.3 <i>Disk drives and peripherals are maintained</i> according to manufacturers' and organisational requirements</p> <p>1.4 <i>Consumables</i> are replaced in accordance with the manufacturers' and organisational requirements</p> <p>1.5 <i>Software</i> applications are installed and operated in accordance with developers' and organisational requirements</p>
2. Provide basic system administration	<p>2.1 System back up procedure is carried out at regular intervals according to organisational and system requirements</p> <p>2.2 Security access procedures are maintained in line with organisational requirements</p> <p>2.3 Licence for use of software is used, checked and recorded in accordance with organisational requirements</p> <p>2.4 Virus systems are maintained and updated on a regular basis in accordance with organisational requirements</p>
3. Identify future technology requirements	<p>3.1 <i>Sources of information</i> about new <i>technology</i> are accessed to maintain knowledge in current technology</p> <p>3.2 Feedback from clients and colleagues is used to identify and develop <i>improved technology systems</i></p> <p>3.3 Existing technology is assessed against newly available technology to determine future needs and</p>

Element

Performance Criteria

- priorities
- 3.4 New technologies are identified and selected to achieve and maintain continuous organisational development
- 3.5 Management and budget approval is obtained for new technologies identified and selected

Range Statement

The Range Statement provides advice to interpret the scope and context of this unit of competency, allowing for differences between enterprises and workplaces. It relates to the unit as a whole and facilitates holistic assessment. The following variables may be present for this particular unit:

Legislation, codes and national standards relevant to the workplace which may include:

- award and enterprise agreements and relevant industrial instruments
- relevant legislation from all levels of government that affects business operation, especially in regard to Occupational Health and Safety and environmental issues, equal opportunity, industrial relations and anti-discrimination
- relevant industry codes of practice

Organisational and system requirements may include:

- quality assurances and/or procedures manuals
- back up procedures
- security and confidentiality procedures
- legal and organisational policy/guidelines and requirements
- storage retrieval and type of product licenses
- storage of information technology documentation
- register of licenses
- Occupational Health and Safety policies, procedures and programs
- code of conduct
- ethical standards
- maintenance of customised software
- updating of virus protection systems

Disk drives and peripherals maintenance may include:

- creating more free space on the hard disk
- reviewing programs
- deleting unwanted files
- cleaning dust from internal and external surfaces
- backing up files before major maintenance
- checking hard drive for errors

Metal and Engineering Training Package

BSBCMN406A Maintain Business Technology

Range Statement

- defragmenting the hard disk
- using up-to-date anti-virus programs

Consumables may include:

- printer ribbons and cartridges
- print heads
- disks
- magnetic tape and cassettes
- print media

Software may include:

- word processing applications
- spreadsheet applications
- accounting applications
- database applications
- presentation applications
- internet/intranet/extranet related programs

Information sources on new technology may include:

- industry associations
- seminars, workshops and training sessions
- the Internet
- computer magazines and journals
- trade fairs
- computer software designers
- computer hardware manufacturers
- internal/external clients
- retail outlets

Technology may include:

- computers
- modems
- software
- client services
- data transfer devices
- scanners
- photocopiers
- printers

Range Statement

Improved technology systems may include:

- access protocols
- cable data transmissions
- delivery and installation systems
- maintenance options
- multi-media
- networking options
- resource usage monitoring

Evidence Guide

The Evidence Guide identifies the critical aspects, underpinning knowledge and skills to be demonstrated to confirm competency for this unit. This is an integral part of the assessment of competency and should be read in conjunction with the Range Statement.

Critical Aspects of Evidence

- Evaluating and mapping network operations
- Reviewing compliance with system protocols
- Installing software and hardware
- Organising and accessing software, materials and consumables
- Maintaining virus, backup and security systems in line with organisational requirements
- Identifying new technologies which match the future needs of the organisation

Underpinning Knowledge*

* At this level the learner must demonstrate understanding of a broad knowledge base incorporating some theoretical concepts.

- The relevant legislation from all levels of government that affects business operation, especially in regard to Occupational Health and Safety and environmental issues, equal opportunity, industrial relations and anti-discrimination
- Knowledge of the costs and benefits of technology maintenance strategies
- Knowledge of organisation's operating systems, including knowledge of networks
- Principles of developing a maintenance schedule for a network
- Knowledge of back up and security procedures, maintenance and diagnostic procedures, licensing and installation and purchasing procedures
- Understanding current industry accepted hardware and software products including knowledge of general features and capabilities
- Understanding organisational business plans, goals and directions
- Understanding methods and processes to prepare

Evidence Guide

budget and cost analysis

- Knowledge of access protocols (eg. internet, TP/TCP)

Underpinning Skills

- Literacy skills to interpret and evaluate the purposes and objectives of various uses of technology; display logical organisation of written information
- Research and analysis skills to analyse and identify organisation's future technology requirements
- Problem solving skills for common network problems
- Report writing skills to organise information from a range of sources to form recommendations
- Analytical skills in relation to systems administration
- Diagnostic skills in relation to identifying problems or faults
- Decision making skills for purchasing of new technology
- Interpersonal skills for cooperating with others on system use
- Presentation skills for explaining the operation of technology in a business environment
- Ability to relate to people from a range of social, cultural and ethnic backgrounds and physical and mental abilities

Resource Implications

The learner and trainer should have access to appropriate documentation and resources normally used in the workplace

Consistency of Performance

In order to achieve consistency of performance, evidence should be collected over a set period of time which is sufficient to include dealings with an appropriate range and variety of situations

Context/s of Assessment

- Competency is demonstrated by performance of all stated criteria, including paying particular attention to the critical aspects and the knowledge and skills elaborated in the Evidence Guide, and within the scope as defined by the Range Statement
- Assessment must take account of the endorsed assessment guidelines in the Business Services Training Package
- Assessment of performance requirements in this unit should be undertaken in an actual workplace or

Evidence Guide

simulated environment

- Assessment should reinforce the integration of the key competencies and the Business Services Common Competencies for the particular AQF Level. Refer to the Key Competency Levels at the end of this unit

Key Competency Levels						
<i>NB: These levels do not relate to the Australian Qualifications Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.</i>						
Collect, analyse and organise information	Communicate ideas and information	Plan and organise activities	Work with others and in teams	Use mathematical ideas and techniques	Solve problems	Use technology
Level 2	Level 2	Level 2	Level 1	Level 2	Level 2	Level 3
<p>Three levels of performance denote level of competency required to perform a task. 1. Perform 2. Administer 3. Design</p> <ul style="list-style-type: none"> • Collecting, analysing and organising information – to formulate recommendations • Communicating ideas and information – with members of the work team • Planning and organising activities – to maintain business technology • Working with teams and others – in completing scheduled tasks • Using mathematical ideas and techniques – as an aid to measure and schedule tasks • Solving problems – to identify future technology requirements • Using technology – to complete allocated tasks <p>Please refer to the Assessment Guidelines for advice on how to use the Key Competencies</p>						

BSBCM408A Report on financial activity

Unit Descriptor	This unit covers the reporting of financial activity for business both in response to client requests and to meet statutory requirements such as the completion of statutory requirement reports. This unit is related to BSBCM308A Maintain financial records.
Competency Field	Common

Element	Performance Criteria
1. Compile financial information and data	<ul style="list-style-type: none">1.1 Current <i>financial data</i> is collected, evaluated and coded to ensure consistency, quality and accuracy in accordance with <i>organisational requirements</i>1.2 <i>Conversion and consolidation procedures</i> are used to compile analysis in accordance with organisational requirements1.3 Asset and liability valuations are made, recorded and disclosed in accordance with organisational requirements1.4 <i>Discrepancies</i>, unusual features or queries are identified, resolved or referred to the appropriate authority
2. Prepare statutory requirement reports	<ul style="list-style-type: none">2.1 Income and expenditure is correctly recorded to ensure compliance with <i>statutory requirements</i>2.2 Liabilities for tax are calculated in accordance with current legislation and <i>revenue gathering practices</i>2.3 Relevant receipts, <i>revenue documentation</i> and payments are identified correctly2.4 Statements and claims take full advantage of <i>available benefits and allowances</i> in accordance with statutory requirements2.5 Statutory requirement reports are submitted to appropriate authorities within <i>stated deadlines</i>
3. Provide financial business recommendations	<ul style="list-style-type: none">3.1 <i>Recommendations</i> are logically derived and supported by <i>evidence</i> in report3.2 Recommendations propose constructive actions to enhance the effectiveness and efficacy of functions and services3.3 Recommendations are concise and facilitate direction and control of organisation's operations

Element

Performance Criteria

- 3.4 *Significant issues* in statements including comparative financial performances are identified and prioritised for review and decision-making
- 3.5 Structure and *format* of reports are clear and conform to organisational and statutory requirements

Range Statement

The Range Statement provides advice to interpret the scope and context of this unit of competency, allowing for differences between enterprises and workplaces. It relates to the unit as a whole and facilitates holistic assessment. The following variables may be present for this particular unit:

Legislation, codes and national standards relevant to the workplace which may include:

- award and enterprise agreements and relevant industrial instruments
- relevant legislation from all levels of government that affects business operation, especially in regard to Occupational Health and Safety and environmental issues, equal opportunity, industrial relations and anti-discrimination
- relevant industry codes of practice

Financial data may include:

- budgets and forecasts
- financial/operational statements and reports (eg. expenditures and receipts, profit and loss statements)
- market valuations
- budget variances
- cash flow/profit reports
- Australian Bureau of Statistics (ABS) economic data
- financial markets monitoring services (eg, Reuters)

Organisational requirements may include:

- quality assurances and/or procedures manuals
- price and exchange parameters
- reporting requirements
- legal and organisational policy/guidelines and requirements
- financial analysis assessments
- Occupational Health and Safety policies, procedures and programs
- recording and filing systems
- standard financial analysis techniques
- financial management manuals

Range Statement

Conversion and consolidation procedures may include:

- spreadsheets
- standardised variables
- moving averages
- unit costs
- trend analysis

Discrepancies may include:

- expenditure report mismatches
- incorrect payments
- absence of auditable trail
- inappropriate authorisations
- variances from budget and phasings
- unreconciled cash flows and operating statements
- incorrect report formats

Statutory requirements may include:

- reporting periods
- taxation payment timings
- delegated authorities
- internal control procedures

Revenue gathering practices may include:

- sales
- leasing
- investments
- billing schedules
- lending and financing
- fees and charges

Revenue documentation may include:

- invoices
- declarations
- bills
- sales proceeds
- cash received
- debit notes

Available benefits and allowances may include:

- depreciation
- donations
- sales tax deductions
- interest payments

Range Statement

Stated deadlines may include:

- monthly returns
- annual reports
- lodgement dates
- payment schedules

Recommendations may relate to:

- profit
- loss
- expenses
- consolidation
- write-offs
- cash flow

Evidence may include:

- budgetary analysis
- forecasts and estimates
- returns on investments
- order and supplier documentation
- taxation and statutory returns

Significant issues may include:

- profitability
- losses and returns
- cost structures
- suppliers
- internal controls
- statutory obligations

Format of reports may include:

- cash flow statements
- statutory forms
- financial year reports
- balance sheets
- operating statements
- spreadsheets
- electronic forms

Evidence Guide

The Evidence Guide identifies the critical aspects, underpinning knowledge and skills to be demonstrated to confirm competency for this unit. This is an integral part of the assessment of competency and should be read in conjunction with the Range Statement.

Critical Aspects of Evidence

- Organising financial data to highlight relevant features
- Presenting of information in comprehensive formats
- Completing of Business Activity Statements
- Interpreting and identifying applications of statutory requirements
- Referring discrepancies outside scope of own responsibility to the appropriate persons

Underpinning Knowledge*

* At this level the learner must demonstrate understanding of a broad knowledge base incorporating some theoretical concepts.

- The relevant legislation from all levels of government that affects business operation, especially in regard to Occupational Health and Safety and environmental issues, equal opportunity, industrial relations and anti-discrimination
- Knowledge of organisational policies and procedures relating to maintaining financial data, reporting, preparing statutory returns
- Principles of double entry bookkeeping and accrual accounting
- Knowledge of techniques for forecasting and analysis
- Understanding methods to present financial data
- Knowledge of State and Federal Government taxes and charges
- Knowledge of financial legislation
- Knowledge of options, methods and practices for deductions, benefits and depreciations
- Principles and practices for auditing and reporting

Evidence Guide

Underpinning Skills

- Literacy skills to identify financial information, to follow Australian Accounting and Auditing Standards and the organisation's accounting procedures
- Research skills to analyse the organisations financial and business status
- Proof reading skills to check accuracy and consistency of information by consulting additional resources
- Problem solving skills for a defined range of predictable problems
- Report writing skills to assess information for relevance and accuracy from a range of sources
- Decision making skills in a limited range of options
- Numeracy skills for calculating data, reconciling figures
- Planning skills for timetabling and scheduling reports and lodgements
- Ability to relate to people from a range of social, cultural and ethnic backgrounds and physical and mental abilities

Resource Implications

The learner and trainer should have access to appropriate documentation and resources normally used in the workplace

Consistency of Performance

In order to achieve consistency of performance, evidence should be collected over a set period of time which is sufficient to include dealings with an appropriate range and variety of situations

Evidence Guide

Context/s of Assessment

- Competency is demonstrated by performance of all stated criteria, including paying particular attention to the critical aspects and the knowledge and skills elaborated in the Evidence Guide, and within the scope as defined by the Range Statement
- Assessment must take account of the endorsed assessment guidelines in the Business Services Training Package
- Assessment of performance requirements in this unit should be undertaken in an actual workplace or simulated environment
- Assessment should reinforce the integration of the key competencies and the Business Services Common Competencies for the particular AQF Level. Refer to the Key Competency Levels at the end of this unit

Key Competency Levels

NB: These levels do not relate to the Australian Qualifications Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Collect, analyse and organise information	Communicate ideas and information	Plan and organise activities	Work with others and in teams	Use mathematical ideas and techniques	Solve problems	Use technology
Level 3	Level 2	Level 2	Level 2	Level 3	Level 2	Level 2

Three levels of performance denote level of competency required to perform a task.

1. Perform 2. Administer 3. Design

- **Collecting, analysing and organising information** – to forecast and provide recommendations
- **Communicating ideas and information** – with members of the work team
- **Planning and organising activities** – for completion of statutory returns and reports
- **Working with teams and others** – in completing scheduled tasks
- **Using mathematical ideas and techniques** – in reconciling financial documents
- **Solving problems** – to identify discrepancies and errors
- **Using technology** – to complete allocated tasks

Please refer to the Assessment Guidelines for advice on how to use the Key Competencies

BSBCMN410A Coordinate implementation of customer service strategies

Unit Descriptor This unit covers the skills and knowledge required to advise on, and carry out customer service strategies, and evaluate customer strategies on the basis of feedback and design strategies for improvement.

This unit is related to BSBCMN310A Deliver and monitor a service to customers.

Competency Field Common

Element	Performance Criteria
1. Advise on customer service needs	<ul style="list-style-type: none">1.1 Customer service <i>needs</i> are clarified and accurately assessed using appropriate <i>communication techniques</i>1.2 Problems matching service delivery to <i>customers</i> are diagnosed and options for improved service are developed within <i>organisational requirements</i>1.3 Advice is relevant, constructive and promotes the improvement of customer service delivery1.4 <i>Business technology</i> is used to structure and present information on customer service needs
2. Support implementation of customer service strategies	<ul style="list-style-type: none">2.1 Customer service strategies and opportunities are promoted to <i>designated individuals and groups</i>2.2 Available budget resources are identified and allocated to fulfil customer service objectives2.3 <i>Procedures to resolve customer difficulties and complaints</i> are actioned promptly within organisational requirements2.4 <i>Coaching and mentoring assistance</i> is provided to colleagues to overcome difficulties in meeting <i>customer service standards</i>2.5 Decisions to implement strategies are taken in consultation with designated individuals and groups
3. Evaluate and report on customer service	<ul style="list-style-type: none">3.1 Client satisfaction with service delivery is reviewed using verifiable data in accordance with organisational requirements3.2 Changes necessary to maintain service standards are identified and reported to designated groups and individuals

Element

Performance Criteria

- 3.3 Conclusions and recommendations are prepared from verifiable evidence and provide constructive advice on future directions of client service strategies
- 3.4 Systems, records and reporting procedures are maintained to compare changes in customer satisfaction

Range Statement

The Range Statement provides advice to interpret the scope and context of this unit of competency, allowing for differences between enterprises and workplaces. It relates to the unit as a whole and facilitates holistic assessment. The following variables may be present for this particular unit:

Legislation, codes and national standards relevant to the workplace which may include:

- award and enterprise agreements and relevant industrial instruments
- relevant legislation from all levels of government that affects business operation, especially in regard to Occupational Health and Safety and environmental issues, equal opportunity, industrial relations and anti-discrimination
- relevant industry codes of practice

Customer needs may relate to:

- advice or general information
- specific information
- further information
- making an appointment
- complaints
- purchasing organisation's products and services
- returning organisation's products and services
- accuracy of information
- fairness/politeness
- prices/value

Range Statement

Communication techniques may include:

- consultation methods, techniques and protocols
- analysing customer satisfaction surveys
- conducting interviews
- questioning
- summarising and paraphrasing
- seeking feedback to confirm understanding
- making recommendations
- obtaining management decisions
- analysing quality assurance data

Customers can be:

- internal or external
- other agencies
- individual members of the organisation
- corporate customers
- individual members of the public

Organisational requirements may include:

- quality assurances and/or procedures manuals
- goals, objectives, plans, systems and processes
- legal and organisational policy/guidelines and requirements
- Occupational Health and Safety policies, procedures and programs
- confidentiality and security requirements
- anti-discrimination and related policy
- access and equity principles and practice
- ethical standards
- quality and continuous improvement processes and standards
- defined resource parameters
- who is responsible for products or services
- pricing and discount policies
- replacement and refund policy and procedures
- payment and delivery options

Range Statement

Business technology may include:

- photocopier
- computer
- printer
- binder
- shredder
- answering machine
- fax machine
- telephone

Designated individuals and groups may include:

- supervisor
- customers
- colleagues
- external organisation
- committee
- line management

Procedures to resolve customer difficulties may include:

- using conflict management techniques
- refund of monies
- item replacement
- referrals to supervisor
- review of products or services
- external agencies (eg Ombudsman)

Customer complaints may include:

- damaged goods or goods not delivered
- administrative errors such as incorrect invoices or prices
- warehouse or store room errors such as incorrect product delivered
- service errors
- delivery errors
- products not delivered on time
- customer satisfaction with service quality

Metal and Engineering Training Package

BSBCMN410A Coordinate Implementation of Customer Service Strategies

Range Statement

Coaching and mentoring assistance may include:

- providing feedback to another team member
- fair and ethical practice
- non-discriminatory processes and activities
- respecting the contribution of all participants and giving credit for achievements
- presenting and promoting a positive image of the collective group
- problem solving
- providing encouragement

Customer service strategies may include:

- delivery times
- price offers
- product/service availability
- product/refund guarantees
- merchandise characteristics
- courtesy/politeness

Evidence Guide

The Evidence Guide identifies the critical aspects, underpinning knowledge and skills to be demonstrated to confirm competency for this unit. This is an integral part of the assessment of competency and should be read in conjunction with the Range Statement.

Critical Aspects of Evidence

- Identifying needs and priorities of the organisation in delivering services to customers
- Distinguishing between different levels of customer satisfaction
- Providing constructive advice on customer service practices
- Responding to and reporting on customer feedback
- Designing strategies to improve delivery of products and services

Underpinning Knowledge*

* At this level the learner must demonstrate understanding of a broad knowledge base incorporating some theoretical concepts.

- The relevant legislation from all levels of government that affects business operation, especially in regard to Occupational Health and Safety and environmental issues, equal opportunity, industrial relations and anti-discrimination
- Understanding the principles of customer services
- Understanding the organisation's business structure, products and services
- Understanding the organisation's policy and procedures for customer service including handling customer complaints
- Knowledge of product and service standards and best practice models
- Knowledge of common problems relating to customer service
- Understanding consultation methods, techniques and protocols
- Knowledge of techniques for dealing with customers with special needs

Evidence Guide

Underpinning Skills

- Planning skills to develop implementation schedules
- Evaluation skills to assess effectiveness of customer service strategies
- Literacy skills to interpret a variety of texts; prepare information and papers; write formal and informal letters according to target audience
- Interpersonal skills to relate effectively to people from a range of social, cultural and ethnic backgrounds
- Technology skills including the ability to select and use technology appropriate to a task
- Problem solving skills to diagnose organisational problems relating to customer services
- Report writing skills to provide recommendations for the enhancement of products or services
- Ability to relate to people from a range of social, cultural and ethnic backgrounds and physical and mental abilities

Resource implications

The learner and trainer should have access to appropriate documentation and resources normally used in the workplace

Consistency of Performance

In order to achieve consistency of performance, evidence should be collected over a set period of time which is sufficient to include dealings with an appropriate range and variety of situations

Context/s of Assessment

- Competency is demonstrated by performance of all stated criteria, including paying particular attention to the critical aspects and the knowledge and skills elaborated in the Evidence Guide, and within the scope as defined by the Range Statement
- Assessment must take account of the endorsed assessment guidelines in the Business Services Training Package
- Assessment of performance requirements in this unit should be undertaken in an actual workplace or simulated environment
- Assessment should reinforce the integration of the key competencies and the Business Services Common Competencies for the particular AQF Level. Refer to the Key Competency Levels at the end of this unit

Key Competency Levels

NB: These levels do not relate to the Australian Qualifications Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Collect, analyse and organise information	Communicate ideas and information	Plan and organise activities	Work with others and in teams	Use mathematical ideas and techniques	Solve problems	Use technology
Level 2	Level 2	Level 2	Level 2	Level 2	Level 2	Level 2

Three levels of performance denote level of competency required to perform a task.

1. Perform 2. Administer 3. Design

- **Collecting, analysing and organising information** – to monitor and report on customer services
- **Communicating ideas and information** – on products and services
- **Planning and organising activities** – to enhance products and services
- **Working with teams and others** – in completing scheduled tasks
- **Using mathematical ideas and techniques** – to determine service or product costs
- **Solving problems** – to respond to customer enquiries or complaints
- **Using technology** – to complete allocated tasks

Please refer to the Assessment Guidelines for advice on how to use the Key Competencies

BSBCMN411A Monitor a safe workplace

Unit Descriptor This unit is concerned with OHS responsibilities of employees with supervisory responsibilities to implement and monitor the organisation's Occupational Health and Safety policies, procedures and programs in the relevant work area to meet legislative requirements. This unit has been adapted from Generic Competency B in the *National Guidelines for Integrating Occupational Health and Safety Competencies into National Industry Competency Standards* [NOHSC:7025 (1998) 2nd edition].

This unit is related to BSBCMN311A Maintain workplace safety.

Competency Field Common

Element	Performance Criteria
1. Provide information to the work group about Occupational Health and Safety policies and procedures	<p>1.1 Relevant provisions of <i>Occupational Health and Safety legislation and codes of practice</i> are accurately explained to the work group</p> <p>1.2 Information on the <i>organisation's Occupational Health and Safety policies, procedures and programs</i> is provided in a readily accessible manner to the work group</p> <p>1.3 Information about <i>identified hazards</i> and the outcomes of <i>risk assessment</i> and control is regularly provided and clearly explained to the work group</p>
2. Implement and monitor participative arrangements for the management of Occupational Health and Safety	<p>2.1 The importance of effective consultative mechanisms in managing health and safety risks are explained</p> <p>2.2 Consultative procedures are implemented and monitored to facilitate participation of work group in management of work area hazards</p> <p>2.3 Issues raised through consultation are promptly dealt with in accordance with <i>organisational consultation procedures</i></p> <p>2.4 The outcomes of consultation over Occupational Health and Safety issues are recorded and communicated promptly to the work group</p>
3. Implement and monitor the organisation's procedures for providing Occupational Health and Safety training	<p>3.1 Occupational Health and Safety training needs are systematically identified in line with organisational requirements</p> <p>3.2 Arrangements are made to meet Occupational Health and Safety training needs of team members in consultation with relevant individuals</p>

Element	Performance Criteria
	3.3 Workplace learning opportunities and coaching and mentoring assistance are provided to facilitate team and individual achievement of identified training needs
	3.4 Costs associated with provision of training for work team are identified and reported to management for inclusion in financial plans
4. Implement and monitor procedures for identifying hazards and assessing risks	4.1 Hazards in work area are identified and reported in accordance with Occupational Health and Safety policies and procedures
	4.2 Team member hazard reports are actioned promptly in accordance with organisational procedures
5. Implement and monitor the organisation's procedures for controlling risks	5.1 <i>Procedures to control risks</i> are implemented using the hierarchy of controls and organisational requirements
	5.2 Inadequacies in existing risk control measures are identified and reported in accordance with hierarchy of controls
	5.3 Outcomes of reported inadequacies are monitored where appropriate to ensure a prompt organisational response
6. Implement and monitor the organisation's procedures for maintaining Occupational Health and Safety records for the team	6.1 <i>Occupational Health and Safety records</i> of incidents of occupational injury and disease in work area are accurately completed and maintained in accordance with OHS legal requirements
	6.2 Aggregate information and data from work area records are used to identify hazards and monitor risk control procedures in work area

Range Statement

The Range Statement provides advice to interpret the scope and context of this unit of competence, allowing for differences between enterprises and workplaces. It relates to the unit as a whole and facilitates holistic assessment. The following variables may be present for this particular unit:

Legislation, codes and national standards relevant to the workplace including:

- award and enterprise agreements and relevant industrial instruments
- relevant legislation from all levels of government that affects business operation, especially in regard to Occupational Health and Safety and environmental issues, equal opportunity, industrial relations and anti-discrimination
- relevant industry codes of practice

Occupational Health and Safety legislation will depend on State and Territory legislation and requirements and will include:

- common law duties to meet the general duty of care requirements
- requirements for the maintenance and confidentiality of records of occupational injury and disease
- provision of information, induction and training
- regulations and approved codes of practice relating to hazards present in work area
- health and safety representatives and health and safety committees
- prompt resolution of health and safety issues

Organisational Occupational Health and Safety policies and procedures may include:

- procedures for hazard identification
- procedures for risk assessment, selection and implementation of risk control measures
- incident (accident) investigation
- OHS audits and safety inspections
- consultative arrangements for employees in work area
- hazard reporting procedures
- safe operating procedures/instructions
- use & care of personal protective equipment
- emergency & evacuation procedures
- purchasing policy & procedures
- plant & equipment maintenance & use
- hazardous substances use and storage
- dangerous goods transport & storage
- OHS arrangements for on site contractors, visitors and members of public
- first aid provision/medical practitioner contact &

Range Statement

attention

- site access

Identifying hazards and assessing risk may occur through activities such as:

- workplace inspections in area of responsibility
- consulting work team members
- housekeeping
- Occupational Health and Safety audits and review of audit reports
- daily informal employee consultation and regular formal employee meetings
- checking equipment before and during work
- review of health and safety records including hazard reports, hazardous substances and dangerous goods registers, injury records

Organisational procedures for consultation may include:

- formal and informal meetings
- health and safety committees
- election of health and safety representatives in accordance with legislative requirements
- attendance of health and safety representatives at management and OHS planning meetings
- other committees, for example, planning and purchasing
- early response to employee suggestions, requests, reports and concerns put forward to management
- counselling/disciplinary processes

Controlling risks may include actions such as:

- removing the cause of a risk at its source (eliminating the hazard) eg. removing stored goods permanently from emergency exit passageways
- selecting control measures in accordance with the hierarchy ie work through hierarchy from most effective to least effective controls.
- job/process/workplace re-design eg introduce mechanical handling equipment, re-arrange materials' flow/timing/scheduling, raise/lower work platforms.
- consultation with employees and their representatives

Organisational health and safety records may include:

- audit & inspection reports
- workplace environmental monitoring records
- consultation eg meetings of Health & Safety Committees, work group meeting agendas including OHS items and actions

Range Statement

- induction, instruction & training
- manufacturer's and supplier's information including dangerous goods storage lists
- hazardous substances registers
- plant and equipment maintenance and testing reports
- workers compensation & rehabilitation records
- first aid/medical post records

Evidence Guide

The Evidence Guide identifies the critical aspects, underpinning knowledge and skills to be demonstrated to confirm competence for this unit. This is an integral part of the assessment of competence and should be read in conjunction with the Range Statement.

Critical Aspects of Evidence

- Apply organisational management systems and procedures to Occupational Health & Safety within work group area
- Identify and comply with Occupational Health and Safety legal and organisational requirements
- Apply procedures for Identifying hazards in the work area
- Apply procedures for assessing and controlling risks to health & safety associated with those hazards, in accordance with the hierarchy of control.
- Provide specific, clear and accurate information and advice on workplace hazards to work group
- Provide appropriate supervision of work group

Underpinning Knowledge*

* At this level the learner must demonstrate understanding of a broad knowledge base incorporating some theoretical concepts.

- The relevant legislation from all levels of government that affects business operation, especially in regard to Occupational Health and Safety and environmental issues, equal opportunity, industrial relations and anti-discrimination
- Knowledge of the legal responsibilities of employers, supervisors and employees in the workplace
- Knowledge of hazards and associated risks which exist in the workplace
- Knowledge of organisation's policies and procedures relating to hazard management, fire, emergency, evacuation, incident (accident) investigating and reporting
- Understanding the relevance of consultation as a key mechanism for improving workplace Occupational Health and Safety culture
- Knowledge of the principles and practices of

Evidence Guide

Occupational Health and safety management

- Knowledge of characteristics and composition of the workgroup

Underpinning Skills

- Analysing skills to identify hazards and assess risks in the work area
- Data analysis skills including:
 - incident (accident) monitoring
 - environmental monitoring
 - evaluation of effectiveness of risk control measures
- Assessment skills to assess resources required to apply risk control measures
- Literacy skills for comprehending documentation and interpreting Occupational Health and Safety requirements
- Technology skills including the ability to operate and shut down equipment
- Coaching and mentoring skills to provide support to colleagues
- Ability to relate to people from a range of social, cultural and ethnic backgrounds and physical and mental abilities

Resource Implications

The learner and trainer should have access to appropriate documentation and resources normally used in the workplace

Consistency of Performance

In order to achieve consistency of performance, evidence should be collected over a set period of time which is sufficient to include dealings with an appropriate range and variety of situations

Context/s of Assessment

- Competency is demonstrated by performance of all stated criteria, including paying particular attention to the critical aspects and the knowledge and skills elaborated in the Evidence Guide, and within the scope as defined by the Range Statement
- Assessment must take account of the endorsed assessment guidelines in the Business Services Training Package
- Assessment of performance requirements in this unit should be undertaken in an actual workplace or simulated environment
- Assessment should reinforce the integration of the key competencies and the Business Services

Evidence Guide

Common Competencies for the particular AQF Level.
Refer to the Key Competency Levels at the end of
this unit

Key Competency Levels						
<i>NB: These levels do not relate to the Australian Qualifications Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.</i>						
Collect, analyse and organise information	Communicate ideas and information	Plan and organise activities	Work with others and in teams	Use mathematical ideas and techniques	Solve problems	Use technology
Level 2	Level 2	Level 2	Level 2	Level 2	Level 2	Level 2
<p>Three levels of performance denote level of competency required to perform a task. 1. Perform 2. Administer 3. Design</p> <ul style="list-style-type: none"> • Collecting, analysing and organising information – to obtain information to advise colleagues of safety responsibilities • Communicating ideas and information – to resolve safety and environmental issues with work team • Planning and organising activities – to plan resource requirements • Working with teams and others – to consult on the control of risk • Using mathematical ideas and techniques – to calculate resource requirements • Solving problems – to investigate improved work methods • Using technology – to use computing systems to access safety information <p>Please refer to the Assessment Guidelines for advice on how to use the Key Competencies</p>						

BSBCMN412A Promote innovation and change

Unit Descriptor This unit covers the skills and knowledge required to promote the use and implementation of innovative work practices to effect change.

This unit is related to BSBCMN312A Support innovation and change.

Competency Field Common

Element	Performance Criteria
1. Identify and develop opportunities for improved work practices	<ul style="list-style-type: none">1.1 Options for change incorporate identified improvements to work practices and procedures1.2 <i>Risk factors</i> affecting change are analysed to identify potential constraints1.3 Change is planned and resourced to promote the introduction and management of new processes1.4 Benefits of <i>change</i> are clear and consistent with <i>organisational requirements</i>1.5 Timelines and targets for implementation are realistic and support the achievement of change
2. Lead team to foster innovative work practices	<ul style="list-style-type: none">2.1 Team members are selected to maximise innovative opportunities2.2 Work assignments are organised to facilitate <i>innovative work skills</i>2.3 Team members are provided with guidance and coaching on innovation in the workplace2.4 Models of innovative work practice are provided and discussed
3. Facilitate commitment to workplace change	<ul style="list-style-type: none">3.1 Opinions and suggestions on improving work practices are encouraged to facilitate participation in change processes3.2 Goals and objectives of change are communicated clearly and promptly to individuals and teams3.3 <i>Business technology</i> is used to manage and provide access to information on progress towards objectives of change3.4 <i>Mentoring and coaching</i> is provided to support individuals and groups in introduction of change3.5 Decisions to overcome problems in the implementation of change are made in consultation with designated individuals and groups

Element	Performance Criteria
	3.6 Effective relations and communications are maintained with clients and stakeholders during the process of change
4. Monitor and evaluate change	4.1 Organisation's systems and technology are used to <i>monitor progress</i> towards objectives
	4.2 Team members are actively encouraged to reflect on team activities and opportunities for improvement and innovation
	4.3 Team activities are evaluated based on feedback from team members, management, clients and other interested people
	4.4 Suggestions for work improvements made by team members are positively received and acted on where appropriate
	4.5 <i>Evidence and information</i> on the impact of change is accurate, relevant and reported within organisational requirements
	4.6 Recommendations for improving methods or techniques to manage change are negotiated with designated individuals and groups using appropriate <i>negotiation skills</i>
	4.7 Systems, records and reporting procedures are maintained according to organisational requirements
	4.8 Feedback on individual and group work practices is prompt and constructive

Range Statement

The Range Statement provides advice to interpret the scope and context of this unit of competence, allowing for differences between enterprises and workplaces. It relates to the unit as a whole and facilitates holistic assessment. The following variables may be present for this particular unit:

- They may use legislation, codes and national standards relevant to the workplace including:**
- award and enterprise agreements and relevant industrial instruments
 - relevant legislation from all levels of government that affects business operation, especially in regard to Occupational Health and Safety and environmental issues, equal opportunity, industrial relations and anti-discrimination
 - relevant industry codes of practice

Range Statement

Change may include:

- implementation of new work practices and/or services
- organisational restructures
- introduction of new technology
- change in work location
- new client base
- staffing changes
- job role changes
- work priorities

Innovative work skills are:

- the skills required to come up with and develop new ideas or the new use of an old idea. They include:
- interpretation
- conceptualisation
- representation
- reflection
- evaluation

Organisational requirements may be included in:

- quality assurances and/or procedures manuals
- goals, objectives, plans, systems and processes
- legal and organisational policy/guidelines and requirements
- Occupational Health and Safety policies, procedures and programs
- business and performance plans
- anti-discrimination and related policy
- access and equity principles and practice
- ethical standards
- quality and continuous improvement processes and standards
- defined resource parameters
- consultation and communication processes

Risk factors may include:

- disturbances to workflow
- confusion/loss of confidence
- cost blow out
- supplier problems
- product/service delivery problems
- time delays

Metal and Engineering Training Package

BSBCMN412A Promote Innovation and Change

Range Statement

Business technology may include:

- computer
- internet/extranet/intranet
- email
- software
- answering machine
- fax machine
- telephone

Mentoring and coaching may include:

- providing feedback to another team member
- fair and ethical practice
- non-discriminatory processes and activities
- respecting the contribution of all participants and giving credit for achievements
- presenting and promoting a positive image of the collective group
- problem solving
- providing encouragement

Monitoring progress may include:

- weekly report
- monthly report
- consultative groups
- Occupational Health and Safety
- union delegates
- financial departments
- public profiles

Evidence and information may include:

- customer surveys
- employee satisfaction
- industrial disputes
- supplier feedback
- productivity measures
- cost savings
- marketshare data

Range Statement

- Negotiation skills may include:**
- assertiveness
 - collaboration
 - solution designing
 - confidence building
 - conflict reduction
 - stress management
 - empathising

Evidence Guide

The Evidence Guide identifies the critical aspects, underpinning knowledge and skills to be demonstrated to confirm competence for this unit. This is an integral part of the assessment of competence and should be read in conjunction with the Range Statement.

- Critical Aspects of Evidence**
- Analysing and evaluating problems associated with change
 - Developing processes to introduce change
 - Establishing plans and schedules to achieve the objectives of change
 - Presenting information on the causes and introduction of the change
 - Communicating priorities, goals and objectives
 - Gathering evidence on the effect of change

Underpinning Knowledge*

* At this level the learner must demonstrate understanding of a broad knowledge base incorporating some theoretical concepts.

- The relevant legislation from all levels of government that affects business operation, especially in regard to Occupational Health and Safety and environmental issues, equal opportunity, industrial relations and anti-discrimination
- Understanding of common effects of change and innovation in the workplace
- Understanding of industrial and organisational context of change
- Understanding of organisation's policies, plans, procedures and structure
- Knowledge of resources required by the organisation's operations
- Understanding processes to interpret and apply feedback
- Knowledge of principles and techniques of goal setting and recording priorities
- Knowledge of the principles of negotiation

Evidence Guide

Underpinning Skills

- Literacy skills to read and understand a variety of texts; prepare general information and papers according to target audience; spell with accuracy; use grammar and punctuation effectively as an aid to understanding
- Planning skills to schedule work activities for the implementation of change
- Team work skills for working as a member of a team during period of changes
- Consultation skills for including stakeholders in the change process
- Analytical skills for monitoring outcomes of change
- Negotiation skills for dealing with competing objectives
- Estimation skills for identifying resources necessary to support introduction of change
- Ability to relate to people from a range of social, cultural and ethnic backgrounds and physical and mental abilities

Resource Implications

The learner and trainer should have access to appropriate documentation and resources normally used in the workplace

Consistency of Performance

In order to achieve consistency of performance, evidence should be collected over a set period of time which is sufficient to include dealings with an appropriate range and variety of situations

Context/s of Assessment

- Competency is demonstrated by performance of all stated criteria, including paying particular attention to the critical aspects and the knowledge and skills elaborated in the Evidence Guide, and within the scope as defined by the Range Statement
- Assessment must take account of the endorsed assessment guidelines in the Business Services Training Package
- Assessment of performance requirements in this unit should be undertaken in an actual workplace or simulated environment
- Assessment should reinforce the integration of the key competencies and the Business Services Common Competencies for the particular AQF Level. Refer to the Key Competency Levels at the end of this unit

Key Competency Levels

NB: These levels do not relate to the Australian Qualifications Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Collect, analyse and organise information	Communicate ideas and information	Plan and organise activities	Work with others and in teams	Use mathematical ideas and techniques	Solve problems	Use technology
Level 2	Level 2	Level 2	Level 2	Level 2	Level 2	Level 2

Three levels of performance denote level of competency required to perform a task.

1. Perform 2. Administer 3. Design

- **Collecting, analysing and organising information** – to set goals and objectives
- **Communicating ideas and information** – with members of the work team
- **Planning and organising activities** – to promote change
- **Working with teams and others** – in completing scheduled tasks
- **Using mathematical ideas and techniques** – as an aid to measure impact of change
- **Solving problems** – to diagnose problems of implementation
- **Using technology** – to manage scheduling of tasks

Please refer to the Assessment Guidelines for advice on how to use the Key Competencies

BSBRKG301A Control records

Unit Descriptor This unit describes the work required to classify, register, and track records and information about records within a business or records system.

Competency Field Business Information

Element	Performance Criteria
1. Identify records for capture	<ul style="list-style-type: none">1.1 Incoming material is categorised for records capture in accordance with organisational procedures1.2 Activity documented by the record is identified from the elements of the record in accordance with organisational procedures1.3 Area or action officer to which the record needs to be forwarded is identified from elements of the record, or its content, and in accordance with organisational procedures1.4 Incoming material is assessed against organisational checklist for determining what material needs to be captured.1.5 Material which does not need to be registered is dealt with in accordance with organisational procedures1.6 Records on which action is complete are located, removed, or copied from the active business or records system, in accordance with organisational procedures1.7 Where required by organisation procedures, the format/media of the record is modified in accordance with organisation requirements and procedures
2. Classify record(s)	<ul style="list-style-type: none">2.1 The identified transaction/action/activity documented by the record is matched to the organisation's classification scheme2.2 The full classification and sentencing of the record is selected in accordance with the system's rules and organisational procedures2.3 The classified/sentenced record is linked to other records in the business or records system in accordance with the system's rules and organisational procedures2.4 Indexing points (cross reference terms) are selected for the record in accordance with the system's rules and organisational procedures

Element

Performance Criteria

- | | |
|-----------------------|---|
| 3. Register record(s) | 3.1 Unique identifier is selected for record in accordance with organisational procedures and business or records system rules |
| | 3.2 Record is registered into business or records system with title, description, details of record creator, immediate location and any other control information to fulfil the system requirements in accordance with organisational procedures and business or records system rules |
| | 3.3 Any physical dependencies or format of a record that will assist with its management over time are recorded in accordance with business or records system rules |
| | 3.4 Access and security status are determined in accordance with organisational procedures and documented in accordance with business or records system rules |
| | 3.5 <i>Disposal</i> class and status of the record is determined and recorded in accordance with the business or records system's rules, and organisational procedures and schedules |
| | 3.6 Record is forwarded to its appropriate location, which is recorded, in accordance with the system rules and organisational procedures |
| | 3.7 The items identified for immediate destruction are separated from the rest of the body of records |
| 4. Track record(s) | 4.1 Unique identifier of record to be located is determined from request or instructions |
| | 4.2 Location of record is obtained from business or records system in accordance with system rules and organisational procedures |
| | 4.3 History of record location is obtained from business or records system in accordance with system rules and organisational procedures |
| | 4.4 Information about record is obtained from business or records system in accordance with system rules and organisational procedures |
| | 4.5 Information about the record is updated and amended in accordance with organisational procedures |
| | 4.6 All transactions on the business or records system are completed within the designated timeframe |

Element

Performance Criteria

- | | |
|---|--|
| 5. Audit records against predetermined criteria | 5.1 Records are <i>located</i> with action officer and in storage areas in accordance with supervisors instructions |
| | 5.2 Records are audited against predetermined <i>criteria</i> in accordance with organisational procedures and quality program |
| | 5.3 Any discrepancies found are noted, and <i>reported</i> , in accordance with organisational procedures |

Range Statement

The Range Statement provides advice to interpret the scope and context of this unit of competence, allowing for differences between enterprises and workplaces. It relates to the unit as a whole and facilitates holistic assessment. The following variables may be present for this particular unit:

Legislation, codes and national standards relevant to the workplace which may include:

- award and enterprise agreements and relevant industrial instruments
- relevant legislation from all levels of government that affects business operation, especially in regard to Occupational Health and Safety and environmental issues, equal opportunity, industrial relations and anti-discrimination
- relevant industry codes of practice

Access status of records may be:

- confidential
- high security (restricted)
- open

Appropriate level may be:

- item level
- chronological group
- series
- business or records system

Quality assurance audit may be of part of, or all of, an organisation

Operating environment may be:

- under supervision
- a team effort
- solo

Range Statement

Record information to be updated may come from:

- supervisor
- user
- file transfer slips
- action officers
- results of quality assurance audit
- requests

Record media may be:

- electronic
- paper-based
- microform
- graphic
- mainframe
- PC-based applications

Records may be registered (captured) into:

- current business or records systems
- archival control systems
- business systems
- storage facilities systems

Records may be subject to special access conditions, arising from agreement with records creator or depositor, privacy or confidentiality considerations

Standard reports prepared from the business or records system may include:

- statistics
- resubmits for following day
- over due action reports
- daily correspondence

Storage may be:

- centralised or decentralised
- off-line or off-site
- in-house or out-sourced
- commercial storage service or government repository
- CD storage
- imaging systems
- microform
- audio-visual/multimedia formats

Range Statement

- Storage environment may be:**
- temperature controlled
 - dust free
 - air conditioned
 - fire secure
 - intrusion secure
- Location of record may be:**
- on a server
 - on a remote drive
 - physical
 - digital
- Disposal actions may include:**
- retention
 - destruction
 - conversion to other record formats
 - transfer
- Criteria for audit may include:**
- location
 - unique identifier
 - content
 - titling
 - compliance with recordkeeping metadata standards / requirements
- Discrepancies may be reported to:**
- colleague
 - supervisor
 - manager
- Form of reporting may be:**
- written
 - oral
 - reconciliation statement

Evidence Guide

The Evidence Guide identifies the critical aspects, knowledge and skills to be demonstrated to confirm competence for this unit. This is an integral part of the assessment of competence and should be read in conjunction with the Range Statement.

Evidence Guide

Critical Aspects of Evidence

- *Demonstrate ability to:*
 - Understand the processes of capture, classification, registration and tracking the location of records
 - Identify activities documented by records and apply classifications schemes
 - Record metadata accurately

Underpinning Knowledge*

* At this level the learner must demonstrate some relevant theoretical knowledge.

- Relevant legislation from all levels of government that affects business operation, especially in regard to Occupational Health and Safety and environmental issues, equal opportunity, industrial relations and anti-discrimination
- Recordkeeping principles and processes
- Concepts of, and reasons for, effective records and archives management
- Knowledge and understanding of organisation's business, functions, structure, and culture
- Organisation's policies, strategies and procedures, particularly those relating to records access and security
- Organisational recordkeeping environments and culture including locations and nature of transactions
- Organisation's recordkeeping and information (including classification) systems

Evidence Guide

Underpinning Skills

- Explaining and clarifying procedures
- Understanding and interpreting instructions
- Listening to, questioning, and clarifying information requests
- Managing own activities within a timeframe
- Records management system and operation including access and security for vital records
- Systematic approach to work
- Using judgement and discretion with confidential information
- Working systematically with accuracy and attention to detail
- Reading and comprehending/interpreting nature of record content
- Interpreting retention and disposal schedules
- Interpreting and applying relevant access and security rules and conditions
- Accurately recording metadata
- Writing reports where precise meaning is required
- Ability to relate to people from a range of social, cultural and ethnic backgrounds and physical and mental abilities

Resource Implications

The learner and trainer should have access to appropriate documentation and resources normally used in the workplace

Consistency of Performance

In order to achieve consistency of performance, evidence should be collected over a set period of time which is sufficient to include dealings with an appropriate range and variety of situations

Evidence Guide

Context/s of Assessment

- Competency is demonstrated by performance of all stated criteria, including paying particular attention to the critical aspects and the knowledge and skills elaborated in the Evidence Guide, and within the scope as defined by the Range Statement
- Assessment must take account of the endorsed assessment guidelines in the Business Services Training Package
- Assessment of performance requirements in this unit should be undertaken in an actual workplace or simulated environment
- Assessment should reinforce the integration of the key competencies and the business services common competencies for the particular AQF level. Refer to the Key Competency Levels at the end of this unit

Key Competency Levels

NB: These levels do not relate to the Australian Qualifications Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Collect, analyse and organise information	Communicate ideas and information	Plan and organise activities	Work with others and in teams	Use mathematical ideas and techniques	Solve problems	Use technology
Level 1	Level 1	Level 1	Level 0	Level 1	Level 1	Level 1

Three levels of performance denote level of competency required to perform a task.

1. Perform 2. Administer 3. Design

- **Collecting, analysing and organising information** – to register, track and record the record within the guidelines of the organisation
- **Communicating ideas and information** – in documenting the location of records
- **Planning and organising activities** – in planning the classification and registration activities
- **Working with teams and others** –
- **Using mathematical ideas and techniques** – in following a logical process to classify, register and track the records
- **Solving problems** – presented by discrepancies between actual and nominal record locations
- **Using technology** – to register and track the records within the organisation’s systems

Please refer to the Assessment Guidelines for advice on how to use the Key Competencies

BSBADM308A Process payroll

Unit Descriptor This unit covers processing of payroll from provided data in manual or computerised payroll systems.

This unit is related to BSBADM505A Manage payroll.

Competency Field Business Administration Services

Element

Performance Criteria

- | | | |
|---|--------------------------|--|
| 1 | Record payroll data | 1.1 Payroll data is checked and discrepancies clarified with <i>designated person/s</i>
1.2 Employee <i>pay period details, deductions and allowances</i> are entered in <i>payroll system</i> in accordance with <i>source data</i>
1.3 Payment due to individual employees is calculated to reflect standard pay and <i>variations</i> in accordance with employee source data |
| 2 | Prepare payroll | 2.1 <i>Payroll</i> is prepared within designated timelines in accordance with organisational policy and procedures
2.2 Total wages for pay period are reconciled, and irregularities checked and corrected, or referred to designated person/s for resolution
2.3 <i>Arrangements for payment</i> are made in accordance with organisational and individual requirements
2.4 Authorisation of payroll and individual pay advice is obtained in accordance with organisational requirements
2.5 <i>Payroll records</i> are produced, checked and stored in accordance with organisational policy and security procedures
2.6 Security procedures for processing payroll and maintaining payroll records are followed |
| 3 | Handle payroll enquiries | 3.1 Payroll <i>enquiries</i> are responded to in accordance with organisational and <i>legislative requirements</i>
3.2 Information is provided in accordance with organisational and legislative requirements
3.3 Enquiries outside area of responsibility / knowledge are referred to designated person/s for resolution
3.4 Additional information or follow-up action is completed within designated timelines in accordance with organisational policy and procedures |

Range Statement

The Range Statement provides advice to interpret the scope and context of this unit of competency, allowing for differences between enterprises and workplaces. It relates to the unit as a whole and facilitates holistic assessment. The following variables may be present for this particular unit:

- Legislation, codes and national standards relevant to the workplace which may include:**
- Award and enterprise agreements and relevant industrial instruments
 - relevant legislation from all levels of government that affects business operation, especially in regard to Occupational Health and Safety and environmental issues, equal opportunity, industrial relations and anti-discrimination
 - relevant industry codes of practice
- Designated person/s may include:**
- those who have the authority to approve payroll decisions
 - immediate supervisor
- Pay period details may include:**
- salary
 - wage
 - casual wage
 - contract
 - piecework
 - commission
 - bonus
- Deductions and allowances may include:**
- income tax
 - superannuation contributions
 - health insurance
 - union dues
 - travel allowance
 - car allowance
 - meal allowance
- Payroll system may include:**
- manual or computerised
- Source documents may include:**
- employee records/history
 - employee earnings and payroll register
 - employee timesheets

Metal and Engineering Training Package

BSBADM308A Process Payroll

Range Statement

Variations may include:

- rates of pay
- overtime
- holiday loading
- paid leave
- unpaid leave
- long service leave
- taxation
- sick leave

Payroll preparation may include:

- calculation of gross pay
- taxation and other deductions
- net pay
- preparing cheques
- electronic funds transfer
- cash analysis
- preparing pay advice slips

Payroll records may include:

- pay advice slips
- employee summary report
- cash analysis sheets
- end of month reports
- electronic funds transfer
- taxation reports
- end of year reports
- group certificates

Enquiries may include:

- face-to-face
- email
- fax
- telephone

Legislative requirements may include:

- confidentiality and security of records
- Australian Tax Office regulations – eg Australian Business Number, Employment Declaration Forms
- payroll tax
- PAYE tax
- Medicare levy
- HECS

Evidence Guide

The Evidence Guide identifies the critical aspects, knowledge and skills to be demonstrated to confirm competency for this unit. This is an integral part of the assessment of competency and should be read in conjunction with the Range Statement.

Critical Aspects of Evidence

- Integrated demonstration of all elements of competency and their performance criteria
- Knowledge and application of legislative requirements
- Accurate data input
- Knowledge of organisational guidelines relating to security and confidentiality of information

Underpinning Knowledge*

* At this level the learner must demonstrate some relevant theoretical knowledge.

- Relevant legislation from all levels of government that affects business operation, especially in regard to Occupational Health and Safety and environmental issues, equal opportunity, industrial relations and anti-discrimination
- Organisational policy and procedures
- Structure of authority in organisation
- Types of payroll systems
- Specific legislative requirements

Underpinning Skills

- Literacy skills to read and understands the organisation's financial *policies and procedures* and legislative procedures, write cheque or salary authorisations; prepare pay advice slips; maintain records
- Numeracy skills for calculating gross and net pay, comparing differing rates of pay over a given time span of the same nature, preparing cash analysis sheets, reconciling figures
- Communication skills including questioning, clarifying, reporting
- Problem solving skills for reconciling figures and resolving employee enquiries within scope of own responsibility
- Time management to meet designated timelines
- Ability to relate to people from a range of social, cultural and ethnic backgrounds and physical and mental abilities

Evidence Guide

Resource Implications

The learner and trainer should have access to appropriate documentation and resources normally used in the workplace which may include:

- workplace reference materials such procedural manuals and company policy
- calculator
- computer equipment and relevant software
- payroll data from preceding pay periods

Consistency of Performance

In order to achieve consistency of performance, evidence should be collected over a set period of time which is sufficient to include dealings with an appropriate range and variety of situations

Context/s of Assessment

- Competency is demonstrated by performance of all stated criteria, including paying particular attention to the critical aspects and the knowledge and skills elaborated in the Evidence Guide, and within the scope as defined by the Range Statement
- Assessment must take account of the endorsed assessment guidelines in the Business Services Training Package
- Assessment of performance requirements in this unit should be undertaken in an actual workplace or simulated environment
- Assessment should reinforce the integration of the key competencies and the business services common competencies for the particular AQF level. Refer to the Key Competency Levels at the end of this unit

Key Competency Levels

NB: These levels do not relate to the Australian Qualifications Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Collect, analyse and organise information	Communicate ideas and information	Plan and organise activities	Work with others and in teams	Use mathematical ideas and techniques	Solve problems	Use technology
Level 1	Level 1	Level 1	Level 1	Level 1	Level 1	Level 1

Three levels of performance denote level of competency required to perform a task.

1. Perform 2. Administer 3. Design

- Collecting, analysing and organising information – to input employee information
- Communicating ideas and information – to respond to enquiries
- Planning and organising activities – to process payroll and prepare pay advice slips
- Working with teams and others – to deal with irregularities outside area of responsibility
- Using mathematical ideas and techniques – to calculate gross and net pay
- Solving problems – to identify and correct irregularities
- Using technology – to process payroll if required

Please refer to the Assessment Guidelines for advice on how to use the Key Competencies

BSBADM402A Produce complex business documents

Unit Descriptor This unit covers design and development of business documents using complex technical features of word processing and/or desktop publishing software.

This unit is related to BSBADM304A Design and develop text documents and BSBADM506A Manage business document design and development.

Competency Field Business Administration Services

Element	Performance Criteria
1. Use safe work practices	<p>1.1 Workspace, furniture and equipment are adjusted to suit the <i>ergonomic requirements</i> of the user</p> <p>1.2 <i>Work organisation</i> meets organisational and statutory requirements for computer operation</p> <p>1.3 Energy and resource <i>conservation techniques</i> are used to minimise wastage in accordance with organisational and statutory requirements</p>
2. Analyse document requirements	<p>2.1 Organisational and task <i>requirements</i> are identified prior to document design</p> <p>2.2 <i>Complex technical functions</i> of the software are evaluated for their usefulness in fulfilling the requirements of the task</p> <p>2.3 Document requirements are matched with software functions to provide efficient production of documents</p>
3. Design complex documents	<p>3.1 Document <i>structure and layout</i> are designed to suit the purpose, audience and information requirements of the task</p> <p>3.2 Document is <i>designed</i> to enhance readability and appearance and meet organisational and task requirements for style and <i>layout</i></p> <p>3.3 Complex software functions are used to enable efficient manipulation of information and other material and ensure <i>consistency of design and layout</i></p> <p>3.4 Manuals, user documentation and on-line help are used to overcome problems with document design and production</p>

Element	Performance Criteria
4. Produce documents	<p>4.1 Complex operations used in development of documents achieve required results</p> <p>4.2 Documents are previewed, adjusted and <i>printed</i> in accordance with organisational and task requirements</p> <p>4.3 Documents are <i>named and stored</i>, in accordance with organisational requirements and the application exited without information loss/damage</p> <p>4.4 Documents are prepared within <i>designated timelines</i> and organisational requirements for speed and accuracy</p>

Range Statement

The Range Statement provides advice to interpret the scope and context of this unit of competence, allowing for differences between enterprises and workplaces. It relates to the unit as a whole and facilitates holistic assessment. The following variables may be present for this particular unit:

- Legislation, codes and national standards relevant to the workplace which may include:**
- award and enterprise agreements and relevant industrial instruments
 - relevant legislation from all levels of government that affects business operation, especially in regard to Occupational Health and Safety and environmental issues, equal opportunity, industrial relations and anti-discrimination
 - relevant industry codes of practice

Range Statement

Complex documents may include:

- long documents
- multiple sections
- multiple headers and footers
- different odd and even pages
- master documents
- subdocuments
- primary mail merge documents
- mail merge data documents
- templates
- multiple users
- hyperlinks
- concordance files
- document protection
- linked and/or embedded objects
- captions
- call outs
- drawing
- WordArt
- forms with fields

Software may include:

- wordprocessing
- advanced desktop publishing

Organisational policy and procedures may include:

- log-on procedures
- password protection
- storage / location of data
- standard formats
- author's instructions
- use of templates

Range Statement

Ergonomic requirements may include:

- workstation height and layout
- chair height, seat and back adjustment
- footrest
- screen position
- keyboard and mouse position
- document holder
- posture
- avoiding radiation from computer screens
- lighting
- noise minimisation

Work organisation may include:

- mix of repetitive and other activities
- rest periods
- exercise breaks

Conservation techniques may include:

- double-sided paper use
- re-used paper for rough drafts (observing confidentiality requirements)
- recycling used and shredded paper
- utilising power-save options for equipment

Organisational requirements may include:

- consistent corporate image
- company logo
- company colour scheme
- established guidelines and procedures for document production
- 'house styles'
- content restrictions
- templates
- organisation name, time, date, document title, filename, etc in header / footer
- observing copyright legislation

Range Statement

Complex technical functions may include:

- table of contents
- index
- importing
- exporting
- linking
- embedding
- merge criteria
- fields
- form fields
- formulae
- sort criteria
- macros
- templates
- display features
- data transfer

Structure and layout may include:

- white space
- typeface
- graphics
- photographs
- drawing
- boxes
- colour
- page layout
- headings
- columns
- letter and memo conventions

Design choices may include:

- simplicity
- diversity
- balance
- typography
- text flow
- relative positioning of graphics and headings

Range Statement

Consistency of design and layout may include:

- indentations
- spacings
- page numbers
- typeface styles and point size
- captions
- bullet/ number lists
- footnotes/endnotes
- annotated references
- borders
- consistency with other business documents

Printing may include:

- with drawing objects
- with comments
- with hidden text
- with field codes
- to fit specific number of pages
- print to file
- print merge

Naming and storage of documents may include:

- file names which are easily identifiable in relation to the content
- file/directory names which identify the operator, author, section, date etc
- file names according to organisational procedure eg numbers rather than names
- storage in folders / sub-folders
- storage on hard/floppy disk drives, CD ROM, tape backup
- organisation policy for backing up files
- organisation policy for filing hard copies of documents
- filing locations
- security
- authorised access

Designated timelines may include:

- timeline agreed with supervisor/person requiring spreadsheet
- timeline agreed with internal/external client
- organisation timeline eg deadline requirements

Evidence Guide

The Evidence Guide identifies the critical aspects, underpinning knowledge and skills to be demonstrated to confirm competence for this unit. This is an integral part of the assessment of competence and should be read in conjunction with the Range Statement.

Critical Aspects of Evidence

- Integrated demonstration of all elements of competency and their performance criteria
- Knowledge and application of complex software functions

Underpinning Knowledge*

* At this level the learner must demonstrate understanding of a broad knowledge base incorporating some theoretical concepts.

- Relevant legislation from all levels of government that affects business operation, especially in regard to Occupational Health and Safety and environmental issues, equal opportunity, industrial relations and anti-discrimination
- Advanced functions of wordprocessing and/or desktop publishing software applications
- Impact of formatting and design on the presentation and readability of documents
- Organisational policies and procedures

Underpinning Skills

- Literacy skills to interpret and evaluate the purposes and objectives of various types of software; consider aspects of context, purpose and audience when generating and formatting texts; display logical organisation of written information through the use of coherently linked paragraphs; use a variety of strategies for planning and reviewing own work; demonstrate drafting techniques; use simple and complex syntactic structures; select vocabulary to create nuances of meaning in particular contexts
- Proofreading and editing skills to ensure clarity of meaning and conformity to organisational requirements; check for accuracy and consistency of information by consulting additional resources
- Problem solving skills to use processes flexibly and interchangeably
- Numeracy skills to collate and present data; graphs and annotated references
- Communication skills to follow complex oral instructions when using technology; listen to and interpret complex sequenced instructions
- Keyboarding skills
- Ability to relate to people from a range of social, cultural and ethnic backgrounds and physical and

Evidence Guide

mental abilities

Resource Implications

- The learner and trainer should have access to appropriate documentation and resources normally used in the workplace which may include:
- Workplace references such as computer user manuals, organisational policies and procedures and workplace procedural manuals
- Computer equipment including relevant software, printer
- Guide/examples of 'house style'
- Equipment (eg paper and other materials)

Consistency of Performance

- In order to achieve consistency of performance, evidence should be collected over a set period of time which is sufficient to include dealings with an appropriate range and variety of situations

Context/s of Assessment

- Competency is demonstrated by performance of all stated criteria, including paying particular attention to the critical aspects and the knowledge and skills elaborated in the Evidence Guide, and within the scope as defined by the Range Statement
- Assessment must take account of the endorsed assessment guidelines in the Business Services Training Package
- Assessment of performance requirements in this unit should be undertaken in an actual workplace or simulated environment
- Assessment should reinforce the integration of the key competencies and the business services common competencies for the particular AQF level. Refer to the Key Competency Levels at the end of this unit

Key Competency Levels

NB: These levels do not relate to the Australian Qualifications Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Collect, analyse and organise information	Communicate ideas and information	Plan and organise activities	Work with others and in teams	Use mathematical ideas and techniques	Solve problems	Use technology
Level 2	Level 1	Level 1	Level 1	Level 1	Level 2	Level 2

Three levels of performance denote level of competency required to perform a task.

1. Perform 2. Administer 3. Design

- **Collecting, analysing and organising information** – to determine document requirements
- **Communicating ideas and information** – through well-designed business documents
- **Planning and organising activities** – to meet designated timelines
- **Working with teams and others** – to determine document purpose and audience
- **Using mathematical ideas and techniques** – to determine design requirements
- **Solving problems** – using manuals and on-line help
- **Using technology** – to produce complex business documents

Please refer to the Assessment Guidelines for advice on how to use the Key Competencies

FNBFIN71A Prepare financial reports to meet statutory requirements

Stream: Insurance - Finance

Functional Area: Analyse Information and Reporting

National Code: FNBFIN71A

Unit Description: This unit describes the functions involved in preparing financial reports to meet statutory requirements.

ELEMENT	PERFORMANCE CRITERIA
1. Identify statutory requirements for reports	1. Statutory rules are regularly and comprehensively reviewed to ensure all requirements for reporting are planned for and met in the required manner. 2. Sources are constantly reviewed to remain aware of changes and amendments. 3. Existing reports are used as a guideline for content and format where available.
2. Plan for provision of reports	4. Timelines are established in order to meet report deadlines. 5. Communication of data requirements to internal users is unambiguous and timely. 6. Lead times are set that ensure adequate time is available and allowance is made for contingencies.
3. Analyse and consolidate reports	7. Reports are reviewed to ensure accuracy with internal accounting records and completeness of data. 8. Reports are reviewed and cross referenced against detailed statutory requirements. 9. Explanation of report results is justified where necessary in required format. 10. Reports are prepared in an accurate, timely and thorough manner. 11. Reports are prepared with a detailed and clear audit trail to ensure comprehensive financial monitoring may be carried out.
4. Submit reports for authorisation	12. All reports comply fully with auditor requirements. 13. All required sign-offs are obtained from responsible parties.
5. Distribute reports	14. Reports are distributed to all parties in a timely manner.

Metal and Engineering Training Package

FNBFIN71A Prepare Financial Reports to Meet Statutory Requirements

ELEMENT	PERFORMANCE CRITERIA
	15. Confirmation of receipt of reports is obtained in order to complete company record of compliance.

RANGE OF VARIABLES	
VARIABLE	SCOPE
Internal accounting records	Internal accounting records include detailed working papers.
Statutory requirements	Statutory requirements are rules for operations determined by industry regulators. May be State or Federal government.
Sources of data	Sources of data input include: general ledger balances lease details related party transactions directors fees shareholders names claims data
Information on statutory requirements	Information on statutory requirements may include: financial consultants company secretariat ASC professional journals ISC company legal counsel external auditors industry associations media actuaries
Pro-formas for reports	Pro-formas for reports may include existing or sample reports showing information requirements and relationship to regulations.
Contingencies	Contingencies may include plans for: non-compliance with timetable omissions and errors computer error data late or not available in required format from source
Distribution	Distribution may be to both internal and external parties such as: Australian Securities Commission fire brigades ISC ISA auditors banks stock exchange Taxation department Australian Bureau of Statistics Stamp Duties Office motor accident authorities ICA shareholders company staff and directors brokers

RANGE OF VARIABLES	
VARIABLE	SCOPE
	work cover authorities policy holders management
Approvals	Approvals/authorisation may be provided by: auditors actuaries company directors chief accountant
Policy and procedures	'Policy' means a policy statement. 'Procedures' means operating procedures. Company policy and procedures may include: operations manuals internal control guidelines computer system documentation
Requirements	Industry and legislative requirements may cover: Australian Accounting Standards Relevant Insurance Act Consumer Credit legislation Trade Practices Act Stamp Duties Act Industry Code of Practice Australian Securities & Companies Code Life Insurance Act Privacy Act Taxation Act

EVIDENCE GUIDE
Interdependent assessment of units: This unit can be assessed independently.
Underpinning knowledge may include: company policy and procedures knowledge or awareness of relevant Acts and regulations legal systems and procedures industry codes of practice computer systems procedure writing Underpinning skills to be demonstrated may include: computerised spreadsheet and database data analysis and interpretation evaluative and general analytical negotiation and interpersonal
Resource implications: Unless otherwise specified, there are no significant resource implications for assessment of this unit, apart from access to a relevant workplace or closely simulated office environment and the use of a range of office equipment, technology and consumables. These may include

EVIDENCE GUIDE
standard commercial computer hardware, software, telephones, facsimiles, and other relevant office equipment.

EVIDENCE GUIDE						
Consistency in performance: This unit requires a variety of assessment contexts and assessment over a period of time sufficient to establish that competency has been demonstrated.						
Context for assessment: Assessment of performance requirements in this unit should be undertaken within the Financial Services Industry context and should cover aspects of personal/financial responsibility and accountability. Competency is demonstrated by performance of all stated criteria, including the Range of Variables applicable to the workplace environment. Aspects of competency, including the attainment of relevant knowledge and skills, may be assessed in a relevant workplace, a closely simulated work environment, or other appropriate means that clearly meet industry competency requirements.						
Key competencies:						
Communi- cating ideas and informatio n	Collecting, analysing and organising informatio n	Planning and organising activities	Working with others in a team	Using mathe- matical ideas and techniques	Solving problems	Using technology
3	3	3	3	3	3	3

<p>UNIT TITLE</p> <p>PMBHAN204B - Package goods/materials</p>
<p>UNIT DESCRIPTOR</p> <p>This competency covers the packaging of goods/materials for despatch or storage.</p> <p>This competency is typically performed by operators working either independently or as part of a work team.</p> <p>This competency in practice</p> <p>This competency applies to operators who package goods and/or loose materials for despatch or storage. The key factors are correctly identifying the packaging requirements and the technology required to package the goods/materials. It includes:</p> <ul style="list-style-type: none"> v identifying and interpreting the packaging requirements v selecting the appropriate technology for packaging v labelling the goods/materials after packaging. <p>PREREQUISITES</p> <p>This competency has no prerequisites.</p>

ELEMENT	PERFORMANCE CRITERIA
1. Prepare goods/materials for packaging.	1.1. Interpret packaging specifications 1.2. Interpret order packaging documentation 1.3. Select appropriate technology for packaging goods/materials 1.4. Identify packaging materials and match specifications.
2. Package goods.	2.1. Complete packaging following standard workplace procedures 2.2. Stack packaged goods/materials to minimise damage.
3. Label packed goods/materials.	3.1. Identify workplace labelling standards 3.2. Identify appropriate goods handling, labelling and other identification symbols 3.3. Attach appropriate label.
4. Complete documentation.	4.1. Complete workplace records/documentation 4.2. Attach invoices and picking slips (where required).

RANGE OF VARIABLES:

This application of this competency will vary according to the product requirements, range of equipment, technology and the varied range of process procedures within an enterprise.

This competency applies to all work environments and sectors within the plastics, rubber and cabling industry. It includes the operation of all relevant ancillary equipment.

The terms documentation, labels and records means any and all relevant information and data whether it is manual, paper based, electronic or verbal, either in person or by phone/radio.

Procedures means all relevant workplace procedures, work instructions, temporary instructions and relevant industry and government codes and standards.

The processes covered by this unit include, but are not limited to:

- identification of goods
- organising the packaging of goods
- organising the labelling of packaged goods.

This competency includes the use of ancillary equipment such as:

- v shrink wrappers
- v tape machine labelers
- v loose bulk packing equipment.

Sources of documentation may include:

- v goods identification numbers and codes
- v manifests
- v picking slips, merchandising transfers, stock requisitions and bar codes
- v manufacturers specifications
- v supplier and/or client instructions.

Typical hazards include:

- v stationary and moving machinery, parts or components
- v noise, light, energy sources
- v humidity, air temperature, radiant heat
- v manual handling hazards.

Typical problems include:

- v insufficient goods to complete order
- v resolving conflicting priorities
- v incomplete or incorrect paperwork.

All operations are performed in accordance with procedures.

EVIDENCE GUIDE:

Essential knowledge and enterprise requirements:

Knowledge of goods and the packaging processes and requirements sufficient to recognise non-standard situations and then determine appropriate action that is consistent with operating guidelines.

Knowledge of the enterprise's procedures and relevant regulatory requirements along with the ability to implement them within appropriate time constraints and work standards.

Competence includes the ability for the practical completion of the job to:

- v apply and/or describe:
- production workflow and requirements for packaging
- packaging methods to minimise waste
- identification symbols
- correct OH&S procedures
- approved hazard control and safety procedures and the use of PPE in relation to handling materials, equipment operation and cleanup
- waste management and importance of reusing non-conforming materials wherever possible
- correct selection and use of equipment, materials, processes and procedures

- v plan own work including predicting consequences and identifying improvements
- v identify when the operator is able to rectify problems, when assistance is required and who is the appropriate source for assistance
- v identify and describe own role and role of others involved directly in the packaging process
- v identify factors which may affect product quality and appropriate remedies
- v use PPE, safely handle products and materials, read relevant safety information and apply safety precautions appropriate to the task
- v distinguish between causes of problems such as:
 - packaging and labelling requirements
 - goods being damaged after packaging.

Critical aspects:

It is essential that competence is demonstrated in the ability to:

- v recognise the importance of material properties and qualities
- v apply approved procedures
- v take appropriate action to resolve problems or report problems.

Consistent performance should be demonstrated. In particular look to see that :

- v packaging standards are met consistently
- v upstream and downstream communication is timely and effective
- v procedures and work instructions are read and interpreted correctly
- v problems are identified and action is taken (ie, the problem is fixed or reported)
- v all safety procedures are followed.

Language, literacy and numeracy requirements:

This unit requires the ability to read and interpret typical product specifications, job sheets, procedures, material labels and safety information as provided to operators.

Writing is required to the level of completing workplace forms.

Basic numeracy is required, eg, to determine that two 25 kg bags are needed to make up a requirement for 50 kg.

Assessment method and context:

Competence in this unit may be assessed:

- v on an operating plant allowing for operation under all normal and a range of abnormal conditions
- v by use of a suitable simulation and/or a range of case studies/scenarios
- v by a combination of these techniques.

In all cases it is expected that practical assessment will be combined with targeted questioning to assess the underpinning knowledge and that the theoretical assessment will be combined with appropriate practical/simulation or similar assessment.

Resource implications:

This section should be read in conjunction with the range of variables for this unit of competency. Resources required include suitable access to an operating plant or equipment that allows for appropriate and realistic simulation. A bank of case studies/scenarios and questions will also be required to the extent that they form part of the assessment method. Questioning may take place either in the workplace, or in an adjacent, quiet facility such as an office or lunchroom. No other special resources are required.

KEY COMPETENCIES

1	2	3	4	5	6	7
Collect, analyse & organise information	Communicate ideas and information	Plan and organise activities	Work with others & in teams	Use mathematical ideas and techniques	Solve problems	Use technology
1	1	1	2	1	1	1

UNIT TITLE

PMBHAN201B - Process orders and despatch products

UNIT DESCRIPTOR

This competency covers the processing of orders and despatching of goods. It applies to all sectors of the industry.

This competency is typically performed by operators working either independently or as part of a work team.

This competency in practice

This competency applies to operators who process despatch orders, despatch stock and maintain records. The key factors are correctly identifying and selecting the goods to be despatched and ensuring they are despatched to the correct location. It includes:
 checking order requests/consignment note documentation for products to be despatched
 identifying and selecting the correct product(s)
 organising products to be moved into the right place by the right time, using the appropriate handling equipment
 completing and checking all documentation
 updating stock records.

PREREQUISITES

This competency has **no** prerequisites.

ELEMENT	PERFORMANCE CRITERIA
1. Identify work requirements.	1.1. Read and interpret order request and consignment note documentation 1.2. Identify required schedules for despatch 1.3. Identify product(s) in order 1.4. Plan sequence of events using workplace and product knowledge 1.5. Select appropriate materials handling equipment within required OH&S regulations and timeframe for the despatch.
2. Prepare goods for despatch.	2.1. Identify and read workplace procedures for assembling and completing orders 2.2. Select goods for despatch 2.3. Check goods for despatch against product knowledge, labels and other identification systems 2.4. Sort, assemble and consolidate products 2.5. Secure order and place in storage areas, in accordance with schedule 2.6. Check order against despatch schedule and order form.

ELEMENT	PERFORMANCE CRITERIA
3. Despatch product.	3.1. Complete workplace records 3.2. Attach appropriate labels and documentation 3.3. Check load labels and documentation and organise loading 3.4. Undertake final check of load labels and documentation 3.5. Explain transportation requirements to driver where appropriate.
4. Complete product movement records.	4.1. Complete product movement records 4.2. Update stock records as required 4.3. Complete other paperwork and records as required.

RANGE OF VARIABLES:

This competency unit covers the organisation of products to be moved within and out of a plant/storage. It is NOT intended for people who, as a major function, operate a warehouse. The appropriate Transport and Distribution competencies should be used here.

This competency applies to all work environments and sectors within the plastics, rubber and cabling industry. It includes the operation of all relevant ancillary equipment.

The terms order request, documentation, labels, transportation requirements, paperwork and records means any and all relevant information and data whether it is manual, paper based, electronic or verbal, either in person or by phone/radio.

Procedures means all relevant workplace procedures, work instructions, temporary instructions and relevant industry and government codes and standards.

The processes covered by this unit include, but are not limited to:
 identification of products
 organising the movement of products
 organising the despatch of products.

This competency includes the use of ancillary equipment such as:
 computers
 mechanical and computerised measuring devices.

Typical problems include:
 insufficient product(s) to complete order
 resolving conflicting priorities
 ensuring the correct products arrive at the correct place at the right time
 incomplete or incorrect paperwork.

All operations are performed in accordance with procedures.

EVIDENCE GUIDE:

Essential knowledge and enterprise requirements:

Knowledge of products and the materials handling processes and requirements sufficient to recognise non-standard situations and then determine appropriate action which is consistent with operating guidelines.

Knowledge of the enterprise's procedures and relevant regulatory requirements along with the ability to implement them within appropriate time constraints and work standards.

Competence includes the ability for the practical completion of the job to:
apply and/or explain:

product knowledge

inventory and ordering systems

transport requirements and restrictions for products

correct OH&S procedures

plan own work including predicting consequences and identifying improvements

identify and describe own role and role of others involved directly in the processing of orders and despatching of products

use PPE, safely handle products and materials, read relevant safety information and apply safety precautions appropriate to the task

distinguish between causes of problems such as:

product requirements

job priority.

Critical aspects:

It is essential that competence is demonstrated in the ability to:

apply approved procedures

take appropriate action to resolve problems or report problems to appropriate personnel.

Consistent performance should be demonstrated. In particular look to see that :

processing and despatching standards are met consistently

upstream and downstream communication is timely and effective

procedures and work instructions are read and interpreted correctly

problems are identified and appropriate action is taken (ie, the problem is fixed or reported)

all safety procedures are followed.

Language, literacy and numeracy requirements:

This unit requires the ability to read and interpret typical product specifications, job sheets, procedures, material labels and safety information as provided to operators.

Writing is required to the level of completing workplace forms.

Basic numeracy is required, eg, to determine that two 25 kg bags are needed to make up a requirement for 50 kg.

Assessment method and context:

Competence in this unit may be assessed:
 on an operating plant allowing for operation under all normal and a range of abnormal conditions
 by use of a suitable simulation and/or a range of case studies/scenarios
 by a combination of these techniques.

In all cases it is expected that practical assessment will be combined with targeted questioning to assess the underpinning knowledge and that the theoretical assessment will be combined with appropriate practical/simulation or similar assessment.

Resource implications:

This section should be read in conjunction with the range of variables for this unit of competency. Resources required include suitable access to an operating plant or equipment that allows for appropriate and realistic simulation. A bank of case studies/scenarios and questions will also be required to the extent that they form part of the assessment method. Questioning may take place either in the workplace, or in an adjacent, quiet facility such as an office or lunchroom. No other special resources are required.

KEY COMPETENCIES

1	2	3	4	5	6	7
Collect, analyse & organise information	Communicate ideas and information	Plan and organise activities	Work with others & in teams	Use mathematical ideas and techniques	Solve problems	Use technology
2	1	2	2	1	1	1

<p>UNIT TITLE</p> <p>PMBHAN202B - Load and unload goods</p>
<p>UNIT DESCRIPTOR</p> <p>This competency covers the loading, unloading and shifting of goods using mechanical aids. It applies to all sectors of the industry.</p> <p>This competency is typically performed by operators working either independently or as part of a work team.</p> <p>This competency in practice</p> <p>This competency applies to operators who move goods using mechanical aids. The key factors are identifying and using the correct equipment and method to move the goods. It includes:</p> <ul style="list-style-type: none"> v planning the correct method to move the goods v moving the goods safely without damage to the goods, personnel or equipment. <p>PREREQUISITES</p> <p>This competency has no prerequisites.</p>

ELEMENT	PERFORMANCE CRITERIA
1. Plan operation.	1.1. Correctly identify type and quantity of product or materials to be moved 1.2. Identify load characteristics including weight, volume, shape, balance and dimensions 1.3. Identify dangerous or other hazardous goods and correct handling procedures 1.4. Identify most efficient and appropriate piece of equipment to be used 1.5. Determine location of storage 1.6. Identify most efficient and appropriate movement route.
2. Relocate load.	2.1. Load specified products or materials using good OH&S practices and complying with all regulations and procedures 2.2. Shift products or materials according to instructions, using good OH&S practices 2.3. Unload products or materials without damage to goods, personnel or equipment using good OH&S practices 2.4. Check load for stability during the loading, shifting and unloading process 2.5. Return equipment to appropriate storage area.
3. Secure and protect load.	3.1. Secure load using appropriate load restraints and protection 3.2. Protect load in accordance with legal and workplace safety requirements 3.3. Check distribution of load to ensure it is even, legal and within safe working capacity.

ELEMENT	PERFORMANCE CRITERIA
4. Complete documentation.	4.1. Inspect load and check for security to travel 4.2. Check holding area conditions meet material requirements 4.3. Store materials as required for production and to meet health and safety needs 4.4. Complete required workplace documentation/records.

RANGE OF VARIABLES:

This competency unit includes the use of manual and mechanical handling aids. It does NOT include the use of licensed load shifting equipment.

This competency applies to all work environments and sectors within the plastics, rubber and cabling industry. It includes the operation of all relevant ancillary equipment.

Procedures means all relevant workplace procedures, work instructions, temporary instructions and relevant industry and government codes and standards.

The processes covered by this unit include, but are not limited to:

- v movement of packages,
- v loose goods,
- v materials and products.

This competency includes the use of equipment such as:

- v hand carts, trolleys, self-propelled trolleys and dollies
- v wheelbarrows
- v block and tackle
- v pallet trucks
- v relevant personal protective equipment.

Typical hazards include:

- v irregular shaped loads
- v unlabelled goods, materials and products.

Typical problems include:

- v load too heavy, large for safe, easy moving
- v load in awkward position for safe, easy moving
- v clash of work priorities
- v correct equipment not available.

All operations are performed in accordance with procedures.

EVIDENCE GUIDE:

Essential knowledge and enterprise requirements:

Knowledge of the materials handling processes and requirements sufficient to recognise non-standard situations and then determine appropriate action which is consistent with operating guidelines.

Knowledge of the enterprise's procedures and relevant regulatory requirements along with the ability to implement them within appropriate time constraints and work standards.

Competence includes the ability for the practical completion of the job to:

- v apply and/or describe:
 - appropriate lifting and moving equipment
 - load and operating limitations of equipment
 - inventory systems
 - correct OH&S procedures
- v plan own work including predicting consequences and identifying improvements
- v identify and describe own role and role of others involved directly in the loading and unloading process
- v use PPE, safely handle products and materials, read relevant safety information and apply safety precautions appropriate to the task
- v distinguish between jobs which:
 - may be easily and safely done with a single person
 - require assistance from other people
 - require manual handling equipment
 - need mechanical lifting aids.

Critical aspects:

It is essential that competence is demonstrated in the ability to:

- v apply approved procedures
- v take appropriate action to resolve problems or report problems to appropriate personnel.

Consistent performance should be demonstrated. In particular look to see that :

- v loading and unloading standards are met consistently
- v upstream and downstream communication is timely and effective
- v procedures and work instructions are read and interpreted correctly
- v problems are identified and appropriate action is taken (ie, the problem is fixed or reported)
- v all safety procedures are followed.

Language, literacy and numeracy requirements:

This unit requires the ability to read and interpret typical product specifications, job sheets, procedures, material labels and safety information as provided to operators.

Writing is required to the level of completing workplace forms.

Basic numeracy is required, eg, to determine that two 25 kg bags are needed to make up a requirement for 50 kg.

Assessment method and context:

Competence in this unit may be assessed:

- v on an operating plant allowing for operation under all normal and a range of abnormal conditions
- v by use of a suitable simulation and/or a range of case studies/scenarios
- v by a combination of these techniques.

In all cases it is expected that practical assessment will be combined with targeted questioning to assess the underpinning knowledge and that the theoretical assessment will be combined with appropriate practical/simulation or similar assessment.

Resource implications:

This section should be read in conjunction with the range of variables for this unit of competency. Resources required include suitable access to an operating plant or equipment that allows for appropriate and realistic simulation. A bank of case studies/scenarios and questions will also be required to the extent that they form part of the assessment method. Questioning may take place either in the workplace, or in an adjacent, quiet facility such as an office or lunchroom. No other special resources are required.

KEY COMPETENCIES

1	2	3	4	5	6	7
Collect, analyse & organise information	Communicate ideas and information	Plan and organise activities	Work with others & in teams	Use mathematical ideas and techniques	Solve problems	Use technology
2	1	1	2	1	1	1

UNIT TITLE

PMBFIN201B - Finish products and components

UNIT DESCRIPTOR

This competency covers a range of processes subsequent to the actual making of the product which have been grouped together under the heading of ‘finishing’. It applies to the finishing of products for customer use, and the finishing of components for use by a subsequent process or organisation which may then further process or assemble these components into a finished product, and similar activities. It applies across all sectors of the industry.

This competency is typically performed by personnel working either independently or as part of a work team.

This competency in practice

This competency applies to production support or moulding operators who are required to apply knowledge of product quality standards, and product defect classification, and operate value adding secondary processing units such as trimming and assembly, and, other personnel who perform initial finishing processes to products after the production process. The key factors are the removal of waste/excess material from the product and preparing the product for either further processing or customer delivery. It includes:

- v checking job sheets for work to be done
- v following approved hazard minimisation procedures for any hazards connected with materials and process, using work instructions, labels and materials safety data sheets, and in accordance with occupational health and safety legislative responsibilities
- v inspecting the product for routine and non-routine finishing processes
- v discussing finishing requirements with other workers
- v applying finishing process to product
- v inspecting finished product and sorting in accordance with job specifications
- v identifying and taking action on routine product imperfections
- v discussing non-routine product imperfections with designated person.

PREREQUISITES

This competency has **no** prerequisites.

ELEMENT	PERFORMANCE CRITERIA
1. Establish requirements for the finishing process.	1.1. Identify work requirements from procedures 1.2. Assemble equipment and consumables for the finishing process 1.3. Consult workplace procedures and materials safety data sheets to confirm the work planning process 1.4. Ensure safety equipment is available and in sound condition 1.5. Remove products from equipment if required using enterprise standard handling methods. 1.6. Recognise end-of-product run.

ELEMENT	PERFORMANCE CRITERIA
2. Check quality of product.	2.1. Inspect product to identify routine and non-routine finishing requirements 2.2. Identify significant finning, flash or other quality problems and report to appropriate person for investigation of <u>mould/die</u> closure/alignment 2.3. Check with appropriate personnel regarding modifications to finishing process 2.4. Identify and process non-conforming products in accordance with workplace procedures.
3. Undertake the finishing operation.	3.1. Trim product as required 3.2. Apply procedures to other finishing processes 3.3. Undertake other secondary process operations required 3.4. Follow waste and recycling procedures 3.5. Inspect finished product and compare to specifications for suitability for further processing or for customer delivery 3.6. Assemble finished products and sort in accordance with procedures 3.7. Pack as required 3.8. Record product data as required 3.9. Clean up work area and perform housekeeping.
4. Identify and rectify routine product imperfections.	4.1. Identify the range of routine imperfections that can occur during the production process 4.2. Determine and rectify routine product imperfections in accordance with procedures 4.3. Ensure appropriate records and log books are maintained to meet procedures/work instructions 4.4. Identify non-routine product imperfections and report to designated person.

RANGE OF VARIABLES:

This competency applies to all work environments and sectors within the plastics, rubber and cabling industry. It includes the operation of all relevant additional equipment where that equipment is integral to the finishing process.

Procedures means all relevant workplace procedures, work instructions, temporary instructions and relevant industry and government codes and standards.

This competency includes the use of equipment and tools such as:

- v electric and/or air powered routers, saws, drills, drivers and sanders
- v knives, files and scrapers
- v hand carts and trolleys
- v hoists/jigs/lifting equipment not requiring any special permits or licences
- v knives and knife sharpeners
- v band saws, hand saws
- v personal safety equipment such as gloves and goggles or face shields
- v handling aids such as jigs and gantries.

Typical hazards include:

- v manual handling hazards
- v knife hazards
- v humidity, air temperature, radiant heat
- v stationary and moving machinery, parts and components.

Typical process problems include:

- v movement of jigs or fixtures
- v power failures
- v non-supply of materials
- v broken cords
- v damaged or inoperable equipment.

Typical product problems include:

- v variations in materials
- v temperature of product to be finished
- v movement of inserts, reinforcements or fittings
- v size of some products.

All operations are performed in accordance with procedures.

EVIDENCE GUIDE:

Essential knowledge and enterprise requirements:

Application of knowledge of the materials, equipment and process sufficient to recognise out of specification product imperfections and techniques necessary to finish products for customer use.

Knowledge of the enterprise's procedures and relevant regulatory requirements along with the ability to implement them within appropriate time constraints and work standards.

Competence includes the ability for the practical completion of the job to:

- v apply and/or explain:
 - selection and application of appropriate processes
 - selection of appropriate tools for the process
- v locate, interpret and apply relevant information to the finishing process
- v identify and safely handle products
- v select and apply appropriate finishing process
- v meet waste and recycling requirements
- v distinguish between causes of faults such as:
 - product defects such as: flashing; distortions; stress marks; sinks, voids; short shots; poor colour distribution; moisture marks; gassing; burn marks
 - inappropriate selection and use of finishing equipment/processes
 - poor surface finish
 - fining or shuts
 - variations in section thickness.

Critical aspects:

It is essential that competence is demonstrated in the ability to:

- v recognise potential situations requiring action
- v implement appropriate action
- v understand procedures.

Consistent performance should be demonstrated. In particular look to see that:

- v production standards are met consistently
- v the importance of critical material properties and quantities to the finishing process is recognised
- v safety procedures are followed.

Language, literacy and numeracy requirements:

This unit requires the ability to read and interpret typical product specifications, job sheets and material labels as provided to operators.

Writing is required to the level of completing workplace forms.

Basic numeracy is also required, eg, counting numbers of products and percentage of rejects.

Assessment method and context:

Competence in this unit may be assessed:

- v on an operating plant allowing for operation under all normal and a range of abnormal conditions
- v by use of a suitable simulation and/or a range of case studies/scenarios
- v by a combination of these techniques.

In all cases it is expected that practical assessment will be combined with targeted questioning to assess the underpinning knowledge and that the theoretical assessment will be combined with appropriate practical/simulation or similar assessment.

Resource implications:

This section should be read in conjunction with the range of variables for this unit of competency. Resources required include suitable access to an operating plant or equipment that allows for appropriate and realistic simulation. A bank of case studies/scenarios and questions will also be required to the extent they form part of the assessment method. Questioning may take place either in the workplace, or in an adjacent, quiet facility such as an office or lunchroom. No other special resources are required.

KEY COMPETENCIES

1 Collect, analyse & organise information	2 Communicate ideas and information	3 Plan and organise activities	4 Work with others & in teams	5 Use mathematical ideas and techniques	6 Solve problems	7 Use technology
2	1	1	2	1	1	1

<p>UNIT TITLE</p> <p>PMBFIN202B - Fit attachments to products</p>
<p>UNIT DESCRIPTOR</p> <p>This competency covers the attachment of parts to products. It applies to all sectors of the industry.</p> <p>This competency is typically performed by all operators working either independently or as part of a work team.</p> <p>This competency in practice</p> <p>This competency applies to operators who attach parts to products as part of the finishing processes of the product. The key factors are the planning of the attachment process and following of the work plan. It includes:</p> <ul style="list-style-type: none"> v checking job sheets for work to be done v identifying hazards and appropriate measures to minimise risks v planning sequence of tasks v testing attachments and product v inspecting finished product v identifying and rectifying routine product imperfections v discussing non-routine product imperfections with designated person. <p>PREREQUISITES</p> <p>This competency has no prerequisites.</p>

ELEMENT	PERFORMANCE CRITERIA
1. Establish requirements for the finishing process.	1.1. Interpret product specifications 1.2. Identify availability of attachments, required materials and tools 1.3. Identify final use and any special characteristics of the product to be assembled in relation to the impact of the assembly process on product quality.
2. Plan fitting process.	2.1. Identify hazards connected with materials and process from observation of equipment and workplace reference materials 2.2. Identify appropriate measures to minimise risks from the identified hazards 2.3. Locate manufacturer's information and safety advice on products and use to plan work 2.4. Plan attachment process to conform to quality specifications, minimise time and economically use materials 2.5. Plan task sequences 2.6. Assemble required materials, tools and facilities and check for suitability of purpose.

ELEMENT	PERFORMANCE CRITERIA
3. Undertake finishing.	3.1. Follow work plan ensuring compliance with procedures 3.2. Test attachments and product for conformity with quality requirements when required 3.3. Inspect finished product and compare to specifications for suitability for further processing or for customer delivery 3.4. Assemble finished products and sort in accordance with procedures 3.5. Follow waste and recycling procedures 3.6. Clean up work area and perform housekeeping.
4. Identify and rectify routine product imperfections.	4.1. Identify the range of routine imperfections that can occur during the process 4.2. Determine and rectify routine product imperfections in accordance with procedures. 4.3. Make sure appropriate records and log books are maintained to meet procedures 4.4. Identify non-routine product imperfections and report to designated person.

RANGE OF VARIABLES:

This competency applies to all work environments and sectors within the plastics, rubber and cabling industry. It includes the operation of all relevant additional equipment.

Procedures means all relevant workplace procedures, work instructions, temporary instructions and relevant industry and government codes and standards.

This competency includes the use of equipment and tools such as:

- v jigs and gantries
- v powered equipment such as drills, drivers,
- v plastic welding equipment as appropriate
- v hand carts and trolleys
- v hoists/jigs/lifting equipment not requiring any special permits or licences
- v transfers, bolts, nuts, inserts, seals, screens and reinforcement
- v relevant personal protective equipment.

Typical hazards include:

- v manual handling hazards
- v humidity, air temperature, radiant heat
- v stationary and moving machinery, parts and components
- v component size and weight.

Typical process problems include:

- v movement of jigs or fixtures
- v power failures
- v non-supply of materials.

Typical product problems include:

- v variations in materials
- v temperature of product to be finished
- v movement of inserts, reinforcements or fittings.

All operations are performed in accordance with procedures.

EVIDENCE GUIDE:

Essential knowledge and enterprise requirements:

Application of knowledge of the materials, equipment and process sufficient to recognise routine and non-routine product imperfections and techniques necessary to fit attachments as part of the finishing process for products.

Knowledge of the enterprise's procedures and relevant regulatory requirements along with the ability to implement them within appropriate time constraints and work standards.

Competence includes the ability for the practical completion of the job to:

- v apply and/or explain:
 - selection and application of appropriate fitting of attachment processes
 - selection of appropriate tools for the process
 - waste and recycling requirements
- v distinguish between causes of faults such as:
 - misaligned or obstructed inserts
 - selection and use of inappropriate finishing equipment/processes.

Critical aspects:

It is essential that competence is demonstrated in the ability to:

- v recognise potential situations requiring action
- v implement appropriate action
- v understand procedures
- v recognise the importance of critical material properties and quantities.

Consistent performance should be demonstrated. In particular look to see that:

- v production standards are met consistently
- v safety procedures are followed.

Language, literacy and numeracy requirements:

This unit requires the ability to read and interpret typical product specifications, job sheets and material labels as provided to operators.

Writing is required to the level of completing workplace forms.

Basic numeracy is also required, eg, counting numbers of products and percentage of rejects.

Assessment method and context:

Competence in this unit may be assessed:

- v on an operating plant allowing for operation under all normal and a range of abnormal conditions
- v by use of a suitable simulation and/or a range of case studies/scenarios
- v by a combination of these techniques.

In all cases it is expected that practical assessment will be combined with targeted questioning to assess the underpinning knowledge and that the theoretical assessment will be combined with appropriate practical/simulation or similar assessment.

Resource implications:

This section should be read in conjunction with the range of variables for this unit of competency. Resources required include suitable access to an operating plant or equipment that allows for appropriate and realistic simulation. A bank of case studies/scenarios and questions will also be required to the extent they form part of the assessment method. Questioning may take place either in the workplace, or in an adjacent, quiet facility such as an office or lunchroom. No other special resources are required.

KEY COMPETENCIES

1	2	3	4	5	6	7
Collect, analyse & organise information	Communicate ideas and information	Plan and organise activities	Work with others & in teams	Use mathematical ideas and techniques	Solve problems	Use technology
2	1	1	2	1	1	1

UNIT TITLE

PMBFIN203B - Repair product imperfections

UNIT DESCRIPTOR

This competency covers the repair of product imperfections during or after production.

This competency is typically performed by all operators working either independently or as part of a work team.

This competency in practice

This competency applies to operators who conduct repairs to products following the manufacturing process. The key factors are the identification of the fault and its reparability, selecting an appropriate repair product or process and making the necessary repairs. It includes:

- v checking job sheets for work requirements
- v identifying the priority in which jobs/product will be completed
- v ensuring appropriate repair materials and equipment are available
- v ensuring the equipment and materials are appropriate for the job
- v carrying out the repair process
- v checking the repair for conformance with specification.

PREREQUISITES

This competency has **no** prerequisites.

ELEMENT	PERFORMANCE CRITERIA
1. Identify damage, and select materials and repair process.	1.1. Interpret product specifications and work order documentation 1.2. Identify product faults and make decisions as to the feasibility of the repair in terms of the intended use of the product and the quality specifications 1.3. Select technology appropriate for the repair 1.4. Identify appropriate repair materials and match to fault and repair method 1.5. Assemble materials and tools and check for suitability for purpose 1.6. Locate and use manufacturer's information and safety advice on products to plan work 1.7. Plan order of work to identify required work sequences, times, work process stages, <u>engineering controls</u> and personal protection equipment 1.8. Design repairs to conform to quality specification, minimise time and economically use consumable materials.
2. Conduct repairs.	2.1. Identify and eliminate sources of contamination 2.2. Prepare surfaces in accordance with manufacturer's instructions and workplace requirements 2.3. Conduct repairs in the appropriate locations and check for conformity with job specification.

ELEMENT	PERFORMANCE CRITERIA
3. Clean work area and prepare products for the next process.	3.1. Clean and inspect used equipment for serviceable condition and store appropriately 3.2. Tag unserviceable equipment, identify faults and inform appropriate personnel 3.3. Inspect and approve repaired products for suitability for further processing or for customer delivery 3.4. Tag products which do not meet quality specifications for further repair or treatment 3.5. Clean work area and return to approved condition.
4. Follow workplace procedures to finish product.	4.1. Follow waste and recycling procedures 4.2. Assemble and sort repaired products for delivery to other work sections in accordance with workplace procedures 4.3. Complete appropriate documentation.

RANGE OF VARIABLES:

This competency applies to all work environments and sectors within the plastics, rubber and cabling industry. It includes the operation of all relevant additional equipment.

Procedures means all relevant workplace procedures, work instructions, temporary instructions and relevant industry and government codes and standards.

This competency unit includes equipment and tools such as:

- v hand carts and trolleys
- v hoists/lifting equipment not requiring any special permits or licences
- v plastic or other filling compounds
- v basic hand tools required for cosmetic repairs of products
- v relevant personal protective equipment.

Typical hazards include:

- v spills
- v dusts/vapours
- v hazardous materials
- v manual handling hazards.

Typical process problems include:

- v inappropriate filling materials being selected and used
- v equipment failures
- v effect of weather on curing times.

Typical product problems include:

- v variations in materials
- v contamination of materials
- v separation of filling and parent materials.

All operations are performed in accordance with procedures.

EVIDENCE GUIDE:

Essential knowledge and enterprise requirements:

Application of knowledge of the materials, equipment and process sufficient to recognise out of specification products, process problems and material faults.

Knowledge of the enterprise's procedures and relevant regulatory requirements along with the ability to implement them within appropriate time constraints and work standards.

Competence includes the ability for the practical completion of the job to:

- v apply and/or explain:
 - impact of incorrect or faulty materials
 - focus of operation of work systems and equipment
 - correct selection and use of equipment, materials, processes and procedures
 - hazards of the materials and process and appropriate hazard control procedures
- v distinguish between causes of routine finishing faults such as:
 - wrong raw materials/additives
 - incorrect quantity of materials/additives/catalyst
 - contaminated materials/additives/catalyst
 - equipment malfunctions
 - tool slips and mould or product inclusions.

Critical aspects:

It is essential that the competence is demonstrated in the ability to:

- v recognise the importance of critical material properties and quantities
- v maintain tools in a manner that promotes cleanliness and safety
- v identify problems and take appropriate action.

Consistent performance should be demonstrated. In particular look to see that:

- v production standards are met consistently
- v all safety procedures are followed.

Language, literacy and numeracy requirements:

This unit requires the ability to read and interpret typical product specifications, job sheets and material labels as provided to operators.

Writing is required to the level of completing workplace forms.

Basic numeracy is also required, eg, to determine that 16 units and 46 units are equal to a total of 62 units.

Assessment method and context:

Competence in this unit may be assessed:

- v on an operating plant allowing for operation under all normal and a range of abnormal conditions
- v by use of a suitable simulation and/or a range of case studies/scenarios
- v by a combination of these techniques.

In all cases it is expected that practical assessment will be combined with targeted questioning to assess the underpinning knowledge and that the theoretical assessment will be combined with appropriate practical/simulation or similar assessment.

Resource implications:

This section should be read in conjunction with the range of variables for this unit of competency. Resources required include suitable access to an operating plant or equipment that allows for appropriate and realistic simulation. A bank of case studies/scenarios and questions will also be required to the extent they form part of the assessment method. Questioning may take place either in the workplace, or in an adjacent, quiet facility such as an office or lunchroom. No other special resources are required.

KEY COMPETENCIES

1 Collect, analyse & organise information	2 Communicate ideas and information	3 Plan and organise activities	4 Work with others & in teams	5 Use mathematical ideas and techniques	6 Solve problems	7 Use technology
2	1	1	2	1	1	1

UNIT TITLE

PMBFIN205B - Hand decorate products

UNIT DESCRIPTOR

This competency covers the hand decorating of products as part of the finishing process of products for customer use. It applies to all sectors of the industry.

This competency is typically performed by all operators working either independently or as part of a work team.

This competency in practice

This competency applies to operators who perform hand decorating techniques to products as part of the finishing process. The key factors are identifying appropriate materials, correct positioning, alignment and cleanliness. It includes:

- v checking job sheets for work to be done
- v following approved hazard minimisation procedures for any hazards connected with materials and process, using work instructions, labels and materials safety data sheets, and in accordance with occupational health and safety legislative responsibilities
- v inspecting the product for routine and non-routine finishing processes
- v discussing finishing requirements with other workers
- v product surface cleanliness
- v applying decorating materials to product
- v inspecting finished product and sorting in accordance with job specifications
- v identifying and rectifying routine product imperfections
- v discussing non-routine product imperfections with designated person.

PREREQUISITES

This competency has **no** prerequisites.

ELEMENT	PERFORMANCE CRITERIA
1. Establish requirements for the finishing process.	1.1. Interpret customer order or product specifications 1.2. Check availability of materials and equipment 1.3. Identify and inspect products to be decorated for suitability of process 1.4. Report unsuitable products to designated person 1.5. Assemble materials, tools and facilities and check for suitability 1.6. Locate manufacturer’s information and safety advice on products and use to plan work 1.7. Identify required work sequences, times, work process stages, <u>engineering controls</u> and personal protective equipment, and plan order of work.
2. Prepare surfaces.	2.1. Inspect product surfaces for contamination or damage 2.2. Identify and eliminate sources of contamination 2.3. Prepare surfaces in accordance with manufacturer’s instructions and workplace requirements.

ELEMENT	PERFORMANCE CRITERIA
3. Hand decorate products.	3.1. Identify required decorations to meet job order requirements 3.2. Ensure decorations are fit for use and return those damaged or unusable 3.3. Apply decorations in the appropriate locations 3.4. Inspect finished product and compare specifications for suitability for further processing or for customer delivery 3.5. Assemble finished products and sort in accordance with procedures 3.6. Clean up work area and perform housekeeping.
4. Identify and rectify routine hand decorating problems.	4.1. Identify the range of <u>routine problems</u> that can occur during the hand decorating process 4.2. Determine and rectify routine hand decorating imperfections in accordance with procedures 4.3. Identify faults in equipment, tag unserviceable equipment and report to designated person 4.4. Ensure appropriate records and logbooks are maintained to meet procedures.

RANGE OF VARIABLES:

This competency applies to all work environments and sectors within the plastics, rubber and cablemaking industry. It includes the operation of all relevant additional equipment where that equipment is integral to the decorating process.

Procedures means all relevant workplace procedures, work instructions, temporary instructions and relevant industry and government codes and standards.

This competency includes equipment and tools such as:

- v hand carts and trolleys
- v hoists, jigs and gantries
- v lifting equipment not requiring any special permits or licences
- v relevant personal protective equipment.

Typical hazards include:

- v manual handling hazards
- v solvents and cleaning agents
- v humidity, air temperature, radiant heat
- v stationary and moving machinery, parts and components.

‘Rectify routine problems’ means ‘apply known solutions to a limited range of predictable problems’.

Typical process problems include:

- v non-supply of product
- v incorrect selection or supply of materials
- v misalignment of decals, transfers or other decorative materials.

Typical product problems include:

- v variations in materials
- v temperature of product to be finished
- v contamination of surfaces
- v decals/transfers or stamps not within specification or not fit for use.

All operations are performed in accordance with procedures.

EVIDENCE GUIDE:

Essential knowledge and enterprise requirements:

Application of knowledge of the materials, equipment and process sufficient to recognise problems that can occur during the hand decorating process.

Knowledge of the enterprise's procedures and relevant regulatory requirements along with the ability to implement them within appropriate time constraints and work standards.

Competence includes the ability for the practical completion of the job to:

- v locate, interpret and apply relevant information to finishing process
- v identify and safely handle products
- v select and apply appropriate finishing process
- v apply and/or explain:
 - waste and recycling requirements
 - non-adherence of transfers, decals or stamps.

Critical aspects:

It is essential that competence is demonstrated in the ability to:

- v understand the importance of critical material properties and quantities
- v recognise potential situations requiring action and then implement appropriate action.

Consistent performance should be demonstrated. In particular look to see that:

- v production standards are met consistently
- v decorations are applied consistently and at an appropriate rate.

Language, literacy and numeracy requirements:

This unit requires the ability to read and interpret typical product specifications, job sheets and material labels as provided to operators.

Writing is required to the level of completing workplace forms.

Basic numeracy is also required, eg, counting numbers of products and percentage of rejects.

Assessment method and context:

Competence in this unit may be assessed:

- v on an operating plant allowing for operation under all normal and a range of abnormal conditions
- v by use of a suitable simulation and/or a range of case studies/scenarios
- v by a combination of these techniques.

In all cases it is expected that practical assessment will be combined with targeted questioning to assess the underpinning knowledge and that the theoretical assessment will be combined with appropriate practical/simulation or similar assessment.

Resource implications:

This section should be read in conjunction with the range of variables for this unit of competency. Resources required include suitable access to an operating plant or equipment that allows for appropriate and realistic simulation. A bank of case studies/scenarios and questions will also be required to the extent they form part of the assessment method. Questioning may take place either in the workplace, or in an adjacent, quiet facility such as an office or lunchroom. No other special resources are required.

KEY COMPETENCIES

1	2	3	4	5	6	7
Collect, analyse & organise information	Communicate ideas and information	Plan and organise activities	Work with others & in teams	Use mathematical ideas and techniques	Solve problems	Use technology
2	1	1	2	1	1	1

UNIT TITLE

PMBPROD315B - Produce polyurethane foam

UNIT DESCRIPTOR

This competency covers the application of knowledge of materials, product purpose and processes to the production of polyurethane foam.

This competency is typically performed by all operators working either independently or as part of a work team.

This competency in practice

This competency applies to operators producing polyurethane foam. The key factors are the adequate planning of the process stages, preparation of the equipment, checking on performance of the equipment and making approved adjustments and equipment corrections. It includes:

- v checking job sheets for work to be done and identifying the priority in which jobs/product will be made/completed
- v ensuring appropriate raw materials are available
- v ensuring the equipment and materials are appropriate for the job
- v carrying out the process
- v checking the outputs for conformance with specification
- v identifying and minimising any hazards connected with materials and process from materials safety data sheets, labels and workplace procedures
- v correcting materials, equipment or process variations and making appropriate adjustments
- v discarding non-conforming products ensuring discarded materials are reused where possible and waste and scrap is disposed of in accordance with workplace instructions
- v solving routine and non-routine equipment and process problems, seeking guidance where necessary or appropriate
- v completing logs and reports.

PREREQUISITES

This competency has **no** prerequisites.

ELEMENT	PERFORMANCE CRITERIA
1. Plan process stages for polyurethane foam production.	1.1. Plan the stages in the polyurethane foaming process and ensure these comply with the quality requirements for production 1.2. Identify and allow for changes in materials at each stage of the polyurethane foaming process 1.3. Plan the availability of the equipment and components for each production stage 1.4. Anticipate the impact of the process on product characteristics and product quality and useability 1.5. Plan work requirements based on procedures.

ELEMENT	PERFORMANCE CRITERIA
<p>2. Identify work requirements for polyurethane foaming operations.</p>	<p>2.1. Prepare materials including base raw materials and additives</p> <p>2.2. Recognise hazards and follow appropriate hazard control/minimisation methods</p> <p>2.3. Check materials, ancillary supplies and equipment are correct</p> <p>2.4. Check equipment and processes used for materials preparation, production process and for the downstream operations are available</p> <p>2.5. Check product quality requirements for the relevant process stage(s)</p> <p>2.6. Identify and check emergency stops, gauges, guards and controls</p> <p>2.7. Plan the task sequences including times and locations for product quality checks, equipment operation and required production outputs</p> <p>2.8. Provide for ongoing materials input, waste management and work area housekeeping requirements</p> <p>2.9. Arrange any required supplementary equipment for product quality testing or routine equipment maintenance and/or adjustments.</p>
<p>3. Check polyurethane foaming process setup.</p>	<p>3.1. Comply with equipment information, required quality specifications and setup procedures</p> <p>3.2. Set up equipment in accordance with required quality specifications and standard operating procedures</p> <p>3.3. Check polyurethane foaming equipment settings and adjustments and conformity to documented procedures</p> <p>3.4. Inspect materials for conformity with requirements including surface condition and materials thickness</p> <p>3.5. Discard non-conforming materials or make adjustments to processing operations in accordance with procedures.</p>
<p>4. Operate and make adjustments as required to the foam process.</p>	<p>4.1. Start up, operate and shut down foam equipment as required by procedures</p> <p>4.2. Monitor polyurethane foaming operations noting product quality, production outputs, equipment operating temperature, amperage, pressures, colour, thickness and product integrity</p> <p>4.3. Make adjustments to remedy faults and non-conformity to production standards where applicable</p> <p>4.4. Collect material which is able to be reprocessed and reused, and dispose of waste and scrap in accordance with workplace procedures</p> <p>4.5. Clean up equipment, lubricate, and adjust in accordance with procedures.</p>
<p>5. Respond to problems.</p>	<p>5.1. Identify possible routine and non-routine problems in the equipment, materials or process</p> <p>5.2. Determine problems needing action</p> <p>5.3. Determine possible fault causes</p>

ELEMENT	PERFORMANCE CRITERIA
	5.4. Rectify problems using appropriate solutions within area of responsibility 5.5. Report problems outside area of responsibility to designated person.

RANGE OF VARIABLES:

This competency applies to all work environments and sectors within the plastics industry. It includes the operation of all relevant ancillary equipment.

Standard procedures means all relevant workplace procedures, work instructions, temporary instructions and relevant industry and government codes and standards.

This competency includes tools and equipment such as:

- v manual handling aids - hand carts and trolleys
- v knives and other bag opening equipment
- v hoists/lifting equipment not requiring any special permits or licences
- v basic hand tools required for opening of material packaging
- v relevant personal protective equipment
- v material loading equipment used for loading of raw materials.

Typical hazards include:

- v spills
- v dusts/vapours
- v slip and fall, particularly due to spilt granules
- v temperature
- v hazardous materials
- v manual handling hazards
- v equipment operations.

Respond to/rectify ‘non-routine problems’ means ‘apply known solutions to a variety of predictable problems’.

Typical process and product problems include:

- v machine malfunction
- v out of specification equipment operation
- v contamination of materials
- v variations in materials and/or contamination of materials
- v processing problems.

Key variables to be monitored include:

- v operating temperatures
- v speed
- v colour
- v cushion specification
- v cycle time
- v output rate
- v product weight
- v product integrity and general conformance to specification/sample.

All operations are performed in accordance with procedures.

EVIDENCE GUIDE:

Essential knowledge and enterprise requirements:

Application of knowledge of the materials, equipment and process sufficient to recognise material and equipment conditions which may lead to out of specification production.

Knowledge of the enterprise's procedures and relevant regulatory requirements along with the ability to implement them within appropriate time constraints and work standards.

Competence includes the ability for the practical completion of the job to:

- v apply and/or explain:
 - products, materials and material characteristics
 - behaviour of materials in relation to heat, pressure and time
 - impact of machine speed, temperature, pressure, time during cycles on product quality and production output
 - impact of variations in raw materials and equipment operation in relation to final product
 - changes to materials at various stages of production
 - waste management and importance of non-conforming materials
- v apply and/or explain:
 - impact of incorrect or faulty materials
 - production workflow sequences and materials demand
 - focus of operation of work systems and equipment
 - correct selection and use of equipment, materials, processes and procedures
 - hazards of the materials and process and appropriate hazard control procedures
- v distinguish between causes of faults such as:
 - wrong raw materials
 - incorrect quantity of materials
 - contaminated materials
 - inadequately mixed materials
- v plan own work including predicting consequences and identifying improvements
- v maintain output and product quality using appropriate instruments, controls, test information and readings
- v make adjustments to equipment operation to rectify variations in equipment operation or product quality
- v start up equipment and make appropriate adjustments to bring process on line
- v take samples when required and identify product out of specification
- v safely shut down equipment in normal or abnormal circumstances
- v identify and describe own role and role of others involved directly in the foam process
- v identify factors which may affect product quality or production output and appropriate remedies
- v identify when the operator is able to rectify faults and when assistance is required
- v identify hazards of the materials and process
- v implement appropriate procedures for hazard control
- v use PPE, safely handle products and materials, read relevant safety information and apply safety precautions appropriate to the task.

Critical aspects:

- It is essential that competence is demonstrated in the ability to
- v identify critical materials properties and polyurethane foaming process characteristics in relation to the process requirements and the end product
 - v plan own work process within workplace procedures and explain the reasons for the steps in the process
 - v take appropriate action to observe equipment, materials and products for out of specification results, make adjustments and identify problems to be reported.

Consistent performance should be demonstrated. In particular look to see that:

- v production quality and output standards are met consistently
- v problems are anticipated from process observations
- v problems are efficiently resolved
- v the process runs consistently and smoothly.

Language, literacy and numeracy requirements:

This unit requires the ability to read and interpret typical product specifications, job sheets and material labels as provided to operators.

Writing is required to the level of completing workplace forms.

Basic numeracy is also required, eg, to determine that 16 units and 46 units are equal to a total of 62 units.

Assessment method and context:

Competence in this unit may be assessed:

- v on an operating plant allowing for operation under all normal and a range of abnormal conditions
- v by use of a suitable simulation and/or a range of case studies/scenarios
- v by a combination of these techniques.

In all cases it is expected that practical assessment will be combined with targeted questioning to assess the underpinning knowledge and theoretical assessment will be combined with appropriate practical/simulation or similar assessment.

Resource implications:

This section should be read in conjunction with the range of variables for this unit of competency. Resources required include suitable access to an operating plant or equipment that allows for appropriate and realistic simulation. A bank of case studies/scenarios and questions will also be required to the extent that they form part of the assessment method. Questioning may take place either in the workplace, or in an adjacent, quiet facility such as an office or lunchroom. No other special resources are required.

KEY COMPETENCIES

1	2	3	4	5	6	7
Collect, analyse & organise information	Communicate ideas and information	Plan and organise activities	Work with others & in teams	Use mathematical ideas and techniques	Solve problems	Use technology

Metal and Engineering Training Package

PMBPROD315B Produce Polyurethane Foam

2	2	2	2	1	2	1
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<p>UNIT TITLE</p> <p>PMBPROD320B - Produce foam injected mouldings</p>
<p>UNIT DESCRIPTOR</p> <p>This competency covers the application of knowledge of materials, product purpose and processes to the production of foam injected mouldings.</p> <p>This competency is typically performed by operators working either independently or as part of a work team.</p> <p>This competency in practice</p> <p>This competency applies to operators of foam injection moulding equipment. The key factors are the adequate planning of the process stages, preparation of the equipment, checking on performance of the equipment and making approved adjustments and equipment corrections. It includes:</p> <ul style="list-style-type: none"> v checking job sheets for work to be done and identifying the priority in which jobs/product will be made/completed v ensuring the equipment and materials are appropriate for the job v producing the product v checking the product for conformance with specification v identifying and planning own work requirements from production requests v identifying and minimising any hazards connected with materials and process from materials safety data sheets, labels and workplace procedures v checking settings and adjustments of equipment v checking materials for conformity to job requirements v correcting materials, equipment or process variations and making appropriate adjustments v discarding non-conforming products ensuring discarded materials are reused where possible and waste and scrap is disposed of in accordance with workplace instructions v solving routine and non-routine foam injection moulding equipment and process problems, seeking guidance where necessary or appropriate v completing logs and reports. <p>PREREQUISITES</p> <p>This competency has no prerequisites.</p>

ELEMENT	PERFORMANCE CRITERIA
<p>1. Plan own work requirements.</p>	<p>1.1. Identify equipment and processes used for production process and upstream and downstream operations from production plan or request</p> <p>1.2. Identify materials required including additives</p> <p>1.3. Recognise hazards and follow appropriate hazard control/minimisation methods</p> <p>1.4. Identify and check emergency stops, guards and controls</p> <p>1.5. Identify requirements for materials, quality, production and equipment checks</p> <p>1.6. Identify materials, waste management and housekeeping needs.</p>

ELEMENT	PERFORMANCE CRITERIA
2. Check foam injection moulding process setup.	2.1. Determine equipment requirements 2.2. Set process to specifications as required 2.3. Check foam injection moulding equipment settings and adjustments are as required 2.4. Check materials are correct 2.5. Discard, or make adjustments to the process for, non-conforming materials 2.6. Set up date, batch and materials markings to specifications, as required 2.7. Complete other pre-start checks in accordance with procedures.
3. Operate and make adjustments as required to the foam injection moulding process.	3.1. Operate foam injection moulding equipment, noting key variables 3.2. Monitor controls/displays/terminals for production/process data 3.3. Monitor product/process quality in accordance with procedures 3.4. Make adjustments to remedy faults and nonconformity to standard as required 3.5. Maintain continuity of process 3.6. Collect and reprocess/discard scrap/trim and other materials in accordance with procedures 3.7. Clean, adjust and lubricate equipment as required 3.8. Pause equipment, or stop equipment in an emergency, following workplace and emergency procedures.
4. Respond to problems.	4.1. Identify possible routine and non-routine problems in the equipment, materials or process 4.2. Determine problems needing action 4.3. Determine possible fault causes 4.4. Rectify problems using appropriate solutions within area of responsibility 4.5. Report problems outside area of responsibility to designated person.

RANGE OF VARIABLES:

This competency applies to the production of foam injected moulded products in the plastics and rubber industries. It includes the operation of all relevant additional equipment where that equipment is integral to the foam injected moulding process.

Procedures means all relevant workplace procedures, work instructions, temporary instructions and relevant industry and government codes and standards.

This competency includes tools and equipment such as:

- v hand carts and trolleys
- v knives and other bag opening equipment
- v hoists/lifting equipment not requiring any special permits or licences
- v basic hand tools required for opening of material packaging
- v relevant personal protective equipment
- v hand tools used in the foam injected product moulding process
- v material loading equipment used for loading of raw materials.

Typical hazards include:

- v spills
- v dusts/vapours
- v hazardous materials
- v manual handling hazards
- v knife hazards.

Respond to/rectify 'non-routine problems' means 'apply known solutions to a variety of predictable problems'.

Typical process and product problems include:

- v variations in materials
- v contamination of materials
- v out of specification machine operation
- v machine malfunction
- v mould/tooling problems
- v processing problems.

Key variables to be monitored include:

- v operating temperatures
- v speed
- v colour
- v cycle time
- v output rate
- v product integrity and general conformance to specification/sample.

All operations are performed in accordance with procedures.

EVIDENCE GUIDE:

Essential knowledge and enterprise requirements:

Application of knowledge of the materials, equipment and process sufficient to recognise material and equipment conditions which may lead to out of specification production.

Knowledge of the enterprise's procedures and relevant regulatory requirements along with the ability to implement them within appropriate time constraints and work standards.

Competence includes the ability for the practical completion of the job to:

- v apply and/or explain:
 - impact of incorrect or faulty materials
 - production workflow sequences and materials demand
 - focus of operation of work systems and equipment
 - correct selection and use of equipment, materials, processes and procedures
 - hazards of the materials and process and appropriate hazard control procedures
- v distinguish between causes of faults such as:
 - wrong raw materials/additives/catalyst
 - incorrect quantity of materials/additives/catalyst
 - contaminated materials/additives/catalyst
- v apply and/or explain:
 - quality requirements at each production stage
 - nature of mechanical, hydraulic, pneumatic, electrical and electronic principles which affect machine operation and product development
 - foam injection moulding cycle and the importance of machine setup and warm-up for effective processing of materials
 - the hierarchy of control including engineering controls
 - impact of variations in raw materials and equipment operation in relation to final product
 - changes to materials at various stages of production
 - waste management and importance of non-conforming materials
- v plan own work including predicting consequences and identifying improvements
- v maintain output and product quality using appropriate instruments, controls, test information and readings
- v make adjustments to equipment operation to rectify variations in equipment operation or product quality
- v check foam injection moulding machine for correct setup to job specifications and implement adjustments or report deviations immediately
- v start up equipment and make appropriate adjustments to bring process on line
- v take samples when required and identify product out of specification
- v safely shut down equipment in normal or abnormal circumstances
- v identify factors which may affect product quality or production output and appropriate remedies
- v identify when the operator is able to rectify faults and when assistance is required
- v identify hazards of the materials and process
- v implement appropriate procedures for hazard control.

Critical aspects:

- It is essential that competence is demonstrated in the ability to
- v identify critical materials properties and foam injection moulding process characteristics in relation to the process requirements and the end product
 - v plan own work process within workplace procedures and explain the reasons for the steps in the process
 - v take appropriate action to observe equipment, materials and products for out of specification results, make adjustments and identify problems to be reported.

Consistent performance should be demonstrated. In particular look to see that:

- v production quality and output standards are met consistently
- v problems are anticipated from process observations
- v problems are efficiently resolved
- v the process runs consistently and smoothly.

Language, literacy and numeracy requirements:

This unit requires the ability to read and interpret typical product specifications, job sheets and material labels as provided to operators.

Writing is required to the level of completing workplace forms.

Basic numeracy is also required, eg, to determine that 16 units and 46 units are equal to a total of 62 units.

Assessment method and context:

Competence in this unit may be assessed:

- v on an operating plant allowing for operation under all normal and a range of abnormal conditions
- v by use of a suitable simulation and/or a range of case studies/scenarios
- v by a combination of these techniques.

In all cases it is expected that practical assessment will be combined with targeted questioning to assess the underpinning knowledge and theoretical assessment will be combined with appropriate practical/simulation or similar assessment.

Resource implications:

This section should be read in conjunction with the range of variables for this unit of competency. Resources required include suitable access to an operating plant or equipment that allows for appropriate and realistic simulation. A bank of case studies/scenarios and questions will also be required to the extent that they form part of the assessment method. Questioning may take place either in the workplace, or in an adjacent, quiet facility such as an office or lunchroom. No other special resources are required.

KEY COMPETENCIES

1	2	3	4	5	6	7
Collect, analyse & organise information	Communicate ideas and information	Plan and organise activities	Work with others & in teams	Use mathematical ideas and techniques	Solve problems	Use technology
2	1	2	2	2	2	2

UNIT TITLE

PMBPROD380A - Produce composites using chopper gun/depositor

UNIT DESCRIPTOR

This competency covers preparation and hand operation of a resin-glass depositor (chopper gun) to form a composite materials product and the solving of non-routine problems.

This competency is typically performed by operators working either independently or as part of a work team.

This competency in practice

This competency applies to operators who are required to apply knowledge of materials, product purpose and processes to the hand operation of chopper guns/depositors for the production of composites. The key factors are the production of material meeting quality standards and product requirements and the recognition and resolving of a range of routine and non-routine problems. It includes:

- v identifying and planning own work requirements from production requests
- v identifying and minimising any hazards connected with materials and process from materials safety data sheets, labels and workplace procedures
- v checking settings and adjustments of equipment
- v checking materials for conformity to job requirements
- v monitoring equipment operation and correcting process variations
- v correcting materials, equipment or process variations and making appropriate adjustments
- v discarding non-conforming products ensuring discarded materials are reused where possible and waste and scrap is disposed of in accordance with workplace instructions
- v solving routine and non-routine composites production equipment and process problems, seeking guidance where necessary or appropriate
- v completing logs and reports.

PREREQUISITES

This competency has **no** prerequisites.

ELEMENT	PERFORMANCE CRITERIA
1. Check work requirements.	1.1. Identify equipment and processes used for production process and upstream and downstream operations from production plan or request 1.2. Identify materials required including additives 1.3. Recognise hazards and follow appropriate hazard control/minimisation methods 1.4. Identify and check emergency stops, guards and controls 1.5. Identify requirements for materials, quality, production and equipment checks 1.6. Identify materials, waste management and housekeeping needs.

ELEMENT	PERFORMANCE CRITERIA
2. Set up equipment, mould and materials.	2.1. Determine equipment requirements 2.2. Adjust controls as required for factors such as ambient conditions, temperature and materials 2.3. Check equipment, raw material and mould all match job requirements 2.4. Check materials, resins, fibres, release agents are correct 2.5. Discard, or make adjustments to the process for, non-conforming materials 2.6. Set up date, batch and materials markings to specifications, as required 2.7. Complete other pre-start checks in accordance with procedures.
3. Hand operate chopper gun/depositor.	3.1. Use chopper gun/depositor to apply materials to the mould to procedures 3.2. Monitor product quality, thickness, colour and integrity 3.3. Remedy faults and non-conformances by adjusting the application of materials as required 3.4. Collect and reprocess/discard scrap/trim and other materials in accordance with procedures 3.5. Shut off machine safely and correctly as required to procedures.
4. Respond to problems.	4.1. Identify possible routine and non-routine problems in the equipment, materials or process 4.2. Determine problems needing action 4.3. Determine possible fault causes 4.4. Rectify problem using appropriate solution within area of responsibility 4.5. Report problems outside area of responsibility to designated person.

RANGE OF VARIABLES:

This competency unit includes the use of equipment and materials to form composite products using a chopper gun/depositor. It includes the operation of all relevant additional equipment where that equipment is integral to the process.

Procedures means all relevant workplace procedures, work instructions, temporary instructions and relevant industry and government codes and standards.

This competency includes tools and equipment such as:

- v open moulds for composite products
- v hand tools for mixing and application
- v knives and cutters to trim fibres
- v chopper gun/depositor, pots, pumps and controls
- v relevant personal protective equipment.

Typical hazards include:

- v hazardous substances
- v manual handling hazards
- v knife hazards.
- v moving equipment
- v manual handling hazards.

Typical problems include:

- v cracks, dents or imperfections of the mould
- v variations in materials, colour, consistency or mix
- v adjustment and settings of the applicator
- v application of the materials to the mould as required
- v contamination of materials.

All operations are performed in accordance with procedures.

EVIDENCE GUIDE:

Essential knowledge and enterprise requirements:

Application of knowledge of the materials, equipment and process sufficient to recognise out of specification products, process problems and materials faults.

Knowledge of the enterprise's procedures and relevant regulatory requirements along with the ability to implement them within appropriate time constraints and work standards.

Competence includes the ability for the practical completion of the job to:

- v apply and/or explain:
 - operation of resin-glass depositor, equipment and components
 - production workflow sequences and materials demand
 - properties of the materials required to form a composite structure of the required strength and surface finish, including the importance of gel coat properties and bonding
 - requirements for correct spraying of materials to the mould surface
 - pot life of the resins used
 - cleanout procedures
 - approved hazard control and safety procedures and the use of PPE in relation to handling materials, equipment operation and clean up
 - potential effects of variations in raw materials and equipment operation in relation to quality of product
 - correct selection and use of equipment, materials, processes and procedures
- v plan own work including predicting consequences and identifying improvements
- v monitor equipment operation and product quality
- v identify when the operator is able to rectify faults, when assistance is required and who is the appropriate source for assistance
- v identify and describe own role and role of others involved directly in the process
- v identify factors which may affect product quality or production output and appropriate remedies
- v use PPE, safely handle products and materials, read relevant safety information and apply safety precautions appropriate to the task
- v pause equipment, or shut down equipment in abnormal circumstances
- v explain the effect of unauthorised or emergency shutdown in relation to safety and

production requirements

v distinguish between possible causes of routine faults such as:

- incorrect quantity of materials
- contaminated materials/additives
- equipment faults
- mould damage
- wrong raw materials/additives
- incorrect quantity of materials/additives
- machine failure.

Critical aspects:

It is essential that competence is demonstrated in the ability to:

- v recognise the importance of material properties and qualities
- v apply approved procedures
- v take appropriate action to resolve faults or report faults to appropriate personnel
- v explain and implement emergency shutdown procedures.

Consistent performance should be demonstrated. In particular look to see that :

- v composites production standards are met consistently
- v upstream and downstream communication is timely and effective
- v operating procedures and work instructions are read and interpreted correctly
- v problems are identified and appropriate action is taken (ie, the problem is fixed or reported)
- v all safety procedures are followed.

Language, literacy and numeracy requirements:

This unit requires the ability to read and interpret typical product specifications, job sheets, procedures, material labels and safety information as provided to operators.

Writing is required to the level of completing workplace forms.

Numeracy is required to the level of determining required weights/volumes of materials in a resin mix for different circumstances (say using a data sheet), number of layers of impregnated matrix required to yield the required product laminate thickness, and similar activities.

Assessment method and context:

Competence in this unit may be assessed:

- v on an operating plant allowing for operation under all normal and a range of abnormal conditions
- v by use of a suitable simulation and/or a range of case studies/scenarios
- v by a combination of these techniques.

In all cases it is expected that practical assessment will be combined with targeted questioning to assess the underpinning knowledge and that the theoretical assessment will be combined with appropriate practical/simulation or similar assessment.

Resource implications:

This section should be read in conjunction with the range of variables for this unit of competency. Resources required include suitable access to an operating plant or equipment that allows for appropriate and realistic simulation. A bank of case studies/scenarios and questions will also be required to the extent that they form part of the assessment method. Questioning may take place either in the workplace, or in an adjacent, quiet facility such as an office or lunchroom. No other special resources are required.

KEY COMPETENCIES

1	2	3	4	5	6	7
Collect, analyse & organise information	Communicate ideas and information	Plan and organise activities	Work with others & in teams	Use mathematical ideas and techniques	Solve problems	Use technology
2	1	1	2	1	1	1

Metal and Engineering Training Package

PRMCL12A Wash External Surfaces to Remove all Visible Dirt and Grime

PRMCL12A Wash external surfaces to remove all visible dirt and grime.

STREAM AM Asset Maintenance

FIELD CL Cleaning

UNIT PRMCL12A Wash external surfaces to remove all visible dirt and grime.

ELEMENT		PERFORMANCE CRITERIA	
1	Identify and confirm need to wash external walls	1	Walls to be washed are identified from client specifications or job instructions
		2	A knowledge of soil types, surfaces and cleaning agents is used to determine if washing will be effective in cleaning the surface
		3	Access to the area is confirmed
		4	Areas adjacent to wall are checked to determine if there is the possibility of damage occurring and preventative action planned
		5	Any pre-existing damage to work site is reported immediately
2	Obtain and set up washing equipment	1	A suitable cleaning agent is selected based on an assessment of the type of surfaces and type of grime to be washed
		2	Cleaning agent is pre-mixed where necessary at correct dilution and temperature as required by manufacturers' specifications in accordance with safety requirements
		3	All equipment is checked to be in good working order to manufacturers' specifications
		4	Where required, suitable wet area safety connections are used for all electrical fittings
		5	Suitable nozzle and extension equipment is fitted to pressure systems to suit operative size and strength
		6	Protective clothing is obtained and checked to be in good working condition
3	Apply washing equipment to external wall	1	Small and hidden areas are washed by hand and rinsed prior to commencing machine based wash
		2	Area is signed and barricaded to avoid accidents in terms of safety and company requirements

Metal and Engineering Training Package

PRMCL12A Wash External Surfaces to Remove all Visible Dirt and Grime

	3	All cleaning agent is rinsed from wall before dry to avoid discolouration	
	4	Pressure jets are applied from ground level using a sturdy two handed grip on pressure nozzle	
	5	Excess water is removed from wall or surrounding area before returning the area to general usage	
4	Clean and store washing implements	1	Washing implements and cleaning cloths are washed in a suitable cleaning agent to remove all dirt and grime
		2	All electrical cords are rewound without kinks or tangles
		3	All equipment is wiped down before storage and checked to be in good working condition
		4	Equipment faults or malfunctions are reported to site supervisor without delay
		5	Washed equipment is stored in an accessible location ready for reuse

RANGE OF VARIABLES

External walls are washed to a height of two (2) metres
Over this height the work is usually performed by specialist operators

Most external walls are cleaned with a high pressure water jet
Manual work is confined to restricted locations

Equipment may include:
high pressure water jet machine

Manufacturers' specifications and safety information may be pre printed on chemical containers; on material safety data sheets; on laminated safety cards at the work site or wall posters

Protective clothing may include:
gloves; safety glasses; safety shoes; face masks; ear muffs/plugs; overalls or as prescribed in regulations or by manufacturers of chemicals or equipment

EVIDENCE GUIDE

Underpinning knowledge

Safe work practices
External wall cleaning methods
Product knowledge
Enterprise and client job specifications
Cleaning and storage procedures
Environmental and work safety requirements

Underpinning skill

Application of cleaning agents
Use of pressure jets on solid surfaces
Reporting procedures
Cleaning and storing of equipment and materials
Safe placement of barricades and signs
Waste management and disposal
Site inspection reports
Problem solving and communication
Basic numeracy and literacy
Dexterity in operating pressure jet equipment

This unit may be assessed in combination with Unit PRM CL11: Spot clean external surfaces to remove all visible marks and Unit PRM CL37: Carry out high level cleaning.

Competence is to be demonstrated through practical demonstrations over the full range of performance criteria. Consistency of outcomes over a period of time should form the basis for assessing practical job requirements. All safety requirements must be strictly observed.

Underpinning knowledge should be assessed through **observation** of work undertaken on external surfaces involving:

- The identification of relevant cleaning requirements
- Planning and organising work, including the procurement of equipment and materials that match job requirements
- The application of cleaning agents to remove spots on external surfaces
- The use of pressure jets to remove stubborn stains
- The disposal of wastes and the cleaning and storage of materials and equipment
- The finish achieved in relation to the job specification

Appreciation of the candidate's understanding of job requirements may be obtained through **oral questioning** about environmental and safety regulations associated with the use of pressure jets on rigid surfaces, chemicals ph scales and the preparation and disposal of cleaning agents on and off-site.

Basic literacy requirements include the ability to read and comprehend the requirements of enterprise procedures (where written) workshop manuals/bulletins and manufacturers' specifications.

Basic numeracy requirements include the ability to understand units of pressure associated with pressure jets.

Particular consideration should be given to assessing the candidate's understanding of hydrostatic (pressure) testing and the identification and use of specialised pressure jet equipment.

Other forms of evidence may include supervisor reports and customer satisfaction surveys.

RESOURCES REQUIRED FOR ASSESSMENT

- Relevant equipment and materials, including cleaning agents, protective clothing and equipment, barricades and safety signs, equipment cleaning apparatus.
- Job specifications
- Site safety requirements, chemical colour code charts
- Equipment operating specifications
- Enterprise and manufacturer procedure manuals, where relevant
- Suitable venue with stained surface for cleaning
- Access to a registered provider of assessment services

SFISHIP201A Comply with organisational and legislative requirements

Functional area

Vessel operations

Prerequisite Unit/s: nil
Descriptor

This unit involves maintaining all records, including statutory requirements and ensuring that operations for which the individual has responsibility comply with *legislative requirements* including anti-pollution and other environmental legislation.

Element of Competency	Performance Criteria
1. Maintain operational records	1.1 Records are clear, concise and accurate 1.2 Record convention and format complies with legislative and organisational requirements 1.3 Level of detail is sufficient to meet the objectives of keeping the record 1.4 Corrections to records are undertaken in such a manner as to maintain their validity 1.5 Procedures for security and confidentiality are always maintained 1.6 Information technology back up procedure follows good operating practices 1.7 Records and reports are distributed to the required authority at appropriate times and places 1.8 Duration and method of storage complies with statutory and enterprise requirements.
2. Undertake work according to organisational legislative requirements	2.1 Procedures for monitoring <i>operations</i> and maintenance are followed according to legislative requirements 2.2 Checks and inspections are made regularly to equipment and to the area of direct <i>responsibility</i> according to enterprise procedures 2.3 Situations leading to potential non-compliance are promptly and fully identified

- | | |
|--|--|
| | 2.4 Remedial action is timely and designed to ensure compliance with legislative requirements |
| | 2.5 <i>Advice</i> given to others on the legitimacy of operations is accurate and is given at the appropriate time |
| | 2.6 Failure of personnel to comply with procedures is identified and reported according to enterprise procedures. |

Range of Variables

The Range of Variables places the competency in context and allows for differences between enterprises and workplaces, including practices, knowledge and requirements. The Range of Variables also provides a focus for assessment and relates to the unit as a whole. The following variables may be present.

Legislative requirements

- the International Convention for the Prevention of Pollution from Ships (MARPOL 73/78)
- fuelling and bunkering
- environmental legislation/regulations
- occupational health and safety standards
- taxation
- workers compensation
- anti-discrimination
- fisheries licensing
- marine safety regulations:
 - fire appliances
 - life saving appliances
 - musters and drills
 - automatic pilot and testing of steering gear
 - distress signals and prevention of collision
 - codes of safe working practice
 - general duties
 - protective clothing and equipment
 - guarding of machinery
 - means of access
 - entry into dangerous spaces
 - hatches and lifting equipment
 - safe movement on board a vessel
 - navigational equipment
 - pilot ladders and hoists
 - regulations on vessel construction and closing of openings.

Records	<ul style="list-style-type: none">• for personal production and maintenance covering own areas of responsibility during duty periods• as required by:<ul style="list-style-type: none">legislationenterprise proceduresline managementgood practice• kept by:<ul style="list-style-type: none">computermanual methodsrecording devices• for recording:<ul style="list-style-type: none">routine activitiesunusual or hazardous occurrencesincidents affecting the safe prosecution and concerns of the voyage.
Operations	<ul style="list-style-type: none">• navigation• fishing• cargo• engineering• maintenance• drills• port operations• towage• sub-sea• contingency response services• catering procedures.
Responsibility	<ul style="list-style-type: none">• covering the areas for which the job holder is directly responsible• offering advice to others• actions of crew• actions of contractors• use and maintenance of equipment.
Advice	<ul style="list-style-type: none">• given on request• given on own instigation.

Evidence Guide

Each unit of competency has an Evidence Guide that relates directly to the Performance Criteria and the Range of Variables. Its purpose is to guide assessment of the unit in the workplace and/or training program. The following components provide information to assist this purpose.

Underpinning knowledge

The essential knowledge and understanding a person needs to perform work to the required standard includes:

- use of computers for record keeping
- use of recording instruments and charts
- entitlement or authorisations to view records
- importance of maintaining accurate records
- personal and corporate penalties for non-compliance
- organisational procedures for dealing with non-compliance
- content of relevant regulations to a level sufficient to carry out watch keeping and maintenance duties
- a general understanding of other legislation pertaining to the operation of the vessel
- what can and cannot be discharged at sea
- procedures for monitoring and disposal of pollutants at sea and by other methods.

Practical skills

The essential skills a person needs to perform work to the required standard include:

- maintaining clear and accurate records.

Literacy skills used for:

- reading regulations and procedures
- making records.

Numeracy skills used for:

- making records.

Critical aspects of evidence

Assessment must confirm the ability to maintain and secure a range of records as detailed in the Range of Variables, in particular produce records, distribute records, store and secure records, maintain procedures and routines, deal with possible non-compliance, advise others, identify problems and remedial action to be taken, and ensure others comply with regulations.

Knowledge of how to gain access to:

- enterprise procedures
- International Convention for the Prevention of Pollution from Ships (MARPOL 73/78) regulations.

Interdependent assessment of units

This unit may be assessed after/with:

- nil.

Context of assessment

Assessment is to be conducted at the workplace or in a simulated workplace environment.

Method of assessment

The following assessment methods are suggested:

- written or oral short answer testing
- practical exercises
- project work
- observation of practical demonstration.

Resources required for assessment

Resources may include:

- examples of applicable regulations.

Metal and Engineering Training Package

SFSHIP201A Comply with Organisational and Legislative Requirements

Key competencies

This refers to the seven areas of generic competency that underpin effective workplace practices. The Key Competencies cover the three levels of performance in the following areas:

Communicating ideas & information	Collecting, analysing & organising information	Planning & organising activities	Working with others and in teams	Using mathematical ideas and techniques	Solving problems	Using technology
Level 2	1	1	2	1	1	2

SFISHIP202A**• Contribute to safe navigation****Functional area****Vessel operations****Prerequisite Unit/s:** nil
Descriptor

This unit involves assisting the officer of the watch safely navigate the vessel or conducting a watch in sole charge of a vessel.

Element of Competency	Performance Criteria
3. 1.	<p>3.1 1.1 <i>Information</i> required for the exchange of a <i>watch</i> is complete, accurate and relevant to both the personnel and the existing circumstances</p> <p>3.2 1.2 Hand over and relief of the watch conforms to accepted <i>principles and procedures</i></p> <p>3.3 1.3 Watch information/instructions that are unclear or ambiguous are always clarified</p> <p>3.4 1.4 Lights, shapes and sound signals displayed or given conform with the requirements contained in the International Regulations for Preventing Collisions at Sea and to instructions received</p> <p>3.5 1.5 Lookout is maintained at all times in such a manner as to conform to accepted principles and procedures</p> <p>3.6 1.6 Reports and exchanges of navigational information are clear and concise and in line with accepted principles and procedures</p> <p>1.7 Traffic, the vessel, weather watch keeping and <i>hazards</i> are <i>monitored</i> with a frequency and intensity conforming to accepted principles and procedures</p> <p>1.8 Frequency and degree of performance checks to navigational equipment complies with principles and procedures, and skipper's and owner's requirements</p> <p>3.7 1.9 Advice or clarification is sought immediately whenever in doubt and from the appropriate people.</p>

4. 2.

- 4.8 2.1 *Manoeuvres* are made so as to safely progress the planned voyage and comply fully with instructions received
- 4.9 2.2 *Engine control systems* are operated to progress the planned passage and are designed to complement helm movements
- 4.10 2.3 Course is steered steadily within acceptable limits with respect to the area of navigation and the existing *sea state*
- 4.11 2.4 Course alterations are smooth and controlled with minimal over shoot
- 4.12 2.5 Communication is clear, concise and acknowledged at all times according to accepted principles and procedures
- 4.13 2.6 Steering modes are changed according to operating instructions, area, wind and sea state and according to marine notices and accepted principles and procedures
- 4.14 2.7 Vessel steering systems remain within safe operating limits during normal manoeuvres.

Range of Variables

The Range of Variables places the competency in context and allows for differences between enterprises and workplaces, including practices, knowledge and requirements. The Range of Variables also provides a focus for assessment and relates to the unit as a whole. The following variables may be present.

Information	<ul style="list-style-type: none"> • obtained from: colleagues watch keeper skipper.
Watch	<ul style="list-style-type: none"> • routines to be maintained when in charge of the bridge watch: during the day at night in narrow waters in coastal waters in severe weather conditions in poor visibility during pilotage or at anchor.

Principles and procedures	<ul style="list-style-type: none">• as itemised in: International Maritime Organisation ‘Basic principles to be observed in keeping a navigational watch’ bridge procedures guide enterprise procedures and standing orders• routines to be maintained when watch keeping.
Hazards	<ul style="list-style-type: none">• with respect to: vessel position weather and sea state traffic and other obstructions status of equipment and systems bar and sea entrance crossings.
Monitored	<ul style="list-style-type: none">• using: sight RADAR sound echo sounder.
Maneuvers	<ul style="list-style-type: none">• may involve: stopping going astern crew overboard.
Engine control systems	<ul style="list-style-type: none">• steering systems• throttle• gear box.
Sea state	<ul style="list-style-type: none">• calm• rough• in a current• tidal conditions.

Evidence Guide

Each unit of competency has an Evidence Guide that relates directly to the Performance Criteria and the Range of Variables. Its purpose is to guide assessment of the unit in the workplace and/or training program. The following components provide information to assist this purpose.

Underpinning knowledge

The underpinning knowledge identified for this unit goes into more depth due its likely inclusion in a group of units that may be used as the basis for the issue of licenses by regulatory bodies.

The essential knowledge and understanding a person needs to perform work to the required standard includes:

- principles and procedures relating to:
 - basic meteorology sufficient to recognise imminent change in the weather and assist in reading meteorological instruments
 - identification of sources of information
 - responsibilities of a look out
 - nautical terminology and the methods of reporting
 - operation of RADAR equipment
 - echo sounding equipment
- knowledge of:
 - classes of and responsibilities between vessels
 - give way and stand on rules
 - International Rules for Preventing Collisions at Sea (COLREG), 1972
 - sound signals
 - distress signals
 - buoyage and navigation mark lights
 - buoyage and navigation mark sound signals and top marks sufficient for them to be recognised
- procedures relating to:
 - emergency steering systems
 - bridge control failure
 - use of operational controls on an auto pilot
 - bridge communications
 - occasions when convention is to seek assistance
 - assessing the risk of collision by sight and RADAR
 - use of helm and engines
 - emergency manoeuvres
- information relating to:
 - International Regulations for Preventing Collisions at Sea (COLREG), 1972
 - bridge procedures guides
 - enterprise procedures

International Maritime Organisation operational guidance for officers in charge of a navigational watch.

Practical skills

The essential skills a person needs to perform work to the required standard include:

- maintaining a watch keeping routine:
 - during the day

Metal and Engineering Training Package

SFSHIP202A Contribute to Safe Navigation

- in narrow waters
- in coastal waters
- in ocean areas
- in severe weather conditions
- in poor visibility
- pilotage
- at anchor
- monitoring:
 - traffic by RADAR, aural and visual means
 - sea state
 - navigation marks and hazards
 - depth
 - safety of the vessel and personnel
 - condition of vessel and personnel
 - weather
 - meteorological instruments
 - meteorological updates
 - communications equipment
- using steering systems:
 - primary
 - back up and emergency systems
 - hand steering
 - auto pilots including change over procedures and operation of system controls for optimum performance
- using engine control systems
- manoeuvring to:
 - maintain a steady course
 - offer timely and obvious responses to potential collision
 - steer a vessel under pilotage
 - berthing
 - crossing bars and narrow entrances.

Literacy skills used for:

- identifying buoyage and navigational marks from a chart
- reading meteorological information and instruments.

Critical aspects of evidence

Assessment must confirm the ability to perform basic navigation, monitoring and control to ensure the safety of a vessel when keeping a watch.

Ability to:

- hand over and take over a navigational watch
- display manoeuvring signals
- maintain a look out
- inform appropriate authority
- delay the need for a navigational response if in doubt
- identify hazards
- seek advice when required.

Knowledge of:

- negotiating buoyage in narrow waters
- negotiating traffic.

Interdependent assessment of units

This unit may be assessed after/with:

- nil.

Context of assessment

Assessment is to be conducted at the workplace or in a simulated workplace environment.

Method of assessment

The following assessment methods are suggested:

- written or oral short answer testing
- practical exercises
- project work
- observation of practical demonstration.

Resources required for assessment

Resources may include:

- operational vessel with the range of equipment described above
- facilities for negotiating buoyage systems and traffic.

Metal and Engineering Training Package

SFSHIP202A Contribute to Safe Navigation

Key competencies

This refers to the seven areas of generic competency that underpin effective workplace practices. The Key Competencies cover the three levels of performance in the following areas:

Communicating ideas & information	Collecting, analysing & organising information	Planning & organising activities	Working with others and in teams	Using mathematical ideas and techniques	Solving problems	Using technology
Level 2	2	1	2	1	1	2

SFISHIP203A • **Maintain the safety and security of the vessel**

Functional area

Vessel operations

**Prerequisite Unit/s:
Descriptor** **nil**

This unit involves securing the vessel when at anchor, moored and berthed and contributing to continued security at all times.

Element of Competency	Performance Criteria
Secure the vessel at anchor	<p><i>Operations</i> are carried out according to established <i>safety rules and regulations</i></p> <p>Preparations and the positioning of the anchor and equipment prior to letting go is appropriate with respect to depth of water, weather and sea conditions, and tidal range in area of operation</p> <p>Quantity of anchor cable run out or recovered complies with orders provided</p> <p>Control of the cable is maintained within safe operating limits of the equipment during normal operation</p> <p>Degree to which the anchor and equipment is secured on completion of anchoring operations is appropriate to anticipated conditions and complies with orders provided</p> <p>Anchor winch operation conforms to manufacturer's recommendations and anchoring requirements</p> <p>Anchoring area is kept free of loose ropes, wires and debris throughout all operations.</p>
Secure and adjust the vessel's position during mooring operations	<p><i>Operations</i> are carried out according to established safety rules and regulations</p> <p>Mooring lines and associated equipment are handled safely and efficiently at all times</p> <p>Mooring area is kept free of loose ropes, wires and debris throughout all operations</p>

	<p>Tension on mooring lines is maintained at a level appropriate to the stage and nature of the operation when warping the vessel or maintaining position</p> <p>Sufficient personnel are made available or sought to ensure the safety and efficiency of all aspects of the mooring operation</p> <p>Reports of incidents made to supervisory personnel are complete and at a time designed to maximise the mooring security of the vessel</p> <p>Mooring lines are secured in accordance with projected vessel operations, tidal conditions or orders provided</p> <p>Equipment malfunction or problems during operations are promptly recognised and appropriate <i>corrective action</i> is taken</p> <p>Communication is clear and concise at all times.</p>
<p>Monitor the situation of the vessel when moored</p>	<p><i>Operations</i> are planned and <i>carried out</i> in accordance with established safety rules and regulations</p> <p>Frequency, timing and coverage of scheduled checks and inspections comply with watch keeping instructions</p> <p>Action taken in the event of <i>irregularities or abnormal conditions</i> is appropriate to their significance and within the job holder's responsibility to implement</p> <p>Reports of incidents made to supervisory personnel are complete and at a time designed to maximise the safety and integrity of the vessel</p> <p>Personnel sufficient for monitoring the situation are made available or sought to ensure the safety and efficiency of all operations</p> <p>Limitations and restrictions on access to the vessel by visitors are in accordance with watch keeping instructions.</p>
<p>4. Secure the vessel for and at sea</p>	<p>4.15 4.1 <i>Operations</i> are planned and carried out in accordance with established safety rules and regulations</p> <p>4.16 4.2 Coverage and frequency of checks and inspections on the vessel's seaworthiness complies with orders received</p> <p>4.17 4.3 Degree to which the vessel is <i>secured</i> is commensurate with anticipated conditions and complies with orders received</p>

- 4.4 Powered equipment is operated in accordance with manufacturer's instructions and safety rules and regulations
- 4.5 Action taken in the event of irregularities is appropriate to their significance and within the job holder's responsibility to implement
- 4.18 4.6 Reports of conditions made to supervisory personnel are complete, accurate and completed in accordance with safety rules and regulations
- 4.19 4.7 Reports on irregularities beyond the job holder's ability to rectify are made in time to enable remedial action to be taken.

Range of Variables

The Range of Variables places the competency in context and allows for differences between enterprises and workplaces, including practices, knowledge and requirements. The Range of Variables also provides a focus for assessment and relates to the unit as a whole. The following variables may be present.

Operations	<p>manual handling of equipment driving powered winches communication and signalling anchoring operations:</p> <ul style="list-style-type: none">• routine• emergency• letting go and recovery <p>mooring operations:</p> <ul style="list-style-type: none">• mooring and unmooring to a single point• berthing and unberthing to a wharf• adjustment from both forward and aft mooring positions• rigging and recovering means of access to the vessel <p>monitoring operations:</p> <ul style="list-style-type: none">• routine fire and security rounds and inspections• display of signals, flags, lights and shapes• mooring integrity during tidal movements• safe access to and about the vessel• visitors to the vessel• environmental impact• departure <p>securing operations:</p> <ul style="list-style-type: none">• prior to departure• completion of operations and maintenance• heavy weather• routine situations.
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Safety rules and regulations	codes of safe working practice: <ul style="list-style-type: none">• industry• enterprise legislation.
Mooring	single point berthed along side a wharf.
Corrective action	adjustment temporary line repair communication.
Carried out	by day by night.
Irregularities or abnormal conditions	affecting the safety and integrity of: <ul style="list-style-type: none">• vessel• the crew• equipment• materials, for example cargo.
Secured	items include: <ul style="list-style-type: none">• openings• lifting appliances and associated equipment• stores and equipment• material, for example cargo• large objects likely to move in a sea way.

Evidence Guide

Each unit of competency has an Evidence Guide that relates directly to the Performance Criteria and the Range of Variables. Its purpose is to guide assessment of the unit in the workplace and/or training program. The following components provide information to assist this purpose.

Underpinning knowledge

The underpinning knowledge identified for this unit goes into more depth due its likely inclusion in a group of units that may be used as the basis for the issue of licenses by regulatory bodies.

The essential knowledge and understanding a person needs to perform work to the required standard includes:

procedures relating to:

- routing and emergency operation of anchors
- use of deck machinery
- preparing deck machinery for use in ambient conditions
- adjusting mooring lines when berthed alongside a wharf
- effect of the rise and fall of tide when berthed
- warping a vessel to various configurations at a wharf
- maintaining a deck watch in port
- display of signals, flags, lights and shapes
- operation of powered equipment in all modes including emergency operation
- checking and inspecting the seaworthiness of the vessel

principles relating to:

- how vessel displacement or profile and prevailing wind or current affect anchoring operations
- how a vessel normally lies to an anchor and cable
- mooring systems including the specific functions of the mooring leads
- effects of unequal tension on mooring lines and the use of fixed mooring lines
- mooring efficiency

information relating to:

- codes of safe working practice and safety rules and regulations
- anchor cable markings
- different types of anchor
- anchor, cable and equipment on a specific vessel
- characteristics of different types of mooring ropes
- hazards that could occur if the operation is not controlled properly
- indications of and hazards associated with breaking mooring lines
- requirements for access equipment
- means of access and regulations
- pilot ladders and hoist regulations
- securing the vessel for sea
- tides and tidal streams
- status of safety equipment
- status of vessel engines and the effect on vessel security
- construction of the vessel sufficient to understand which areas need to be made watertight
- the method of operation of cargo lifting and securing equipment
- how to make the vessel watertight.

Practical skills

The essential skills a person needs to perform work to the required standard include:

letting go and weighing anchor:

- single and twin anchor (such as a running moor) operations
- recovering a foul hawse
- removing debris from an anchor

handling of anchor securing arrangements

display of signals

use of anchor buoy

communications with controller

securing of anchor and equipment for:

- sea passage
- transit in port or ready for use

using and identifying synthetic rope and wire mooring lines:

- forward and aft springs
- back springs
- bow and stern ropes
- breast lines

different types of mooring operations:

- making fast and letting go fore and aft to a wharf
- making fast and letting go to a single point mooring
- preparing area for operation
- using springs that manoeuvre a vessel to and from a wharf
- adjusting mooring during a port stay
- rigging safe access to a vessel

contingency actions to take when encountering a malfunction or problem:

- failure of moorings and equipment
- damage to moorings
- insufficiency of mooring length or strength
- poor leads
- inability to maintain vessel in position
- caused by weather
- caused by cargo or cargo securing arrangements

handling ropes and wires:

- identifying different rope construction
- identifying the material that is used in rope construction
- attachment to bitts, bollards and other mooring equipment
- use of hitches and securing arrangements
- use of stoppers
- using deck machinery
- signalling to winch drivers

using different anchoring and mooring winches:

- tension winches operated in manual or self tensioning modes
- stand alone winches, windlasses and capstans with drum ends

perform routine fire, flooding and security rounds and inspections

rig and monitor signals, flags, lights and shapes

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use power operated equipment:

- cranes, derricks
- winches associated with fishing
- anchoring and mooring winches
- weather deck and 'tween deck hatches
- bow and stern doors

secure large objects such as:

- containers
- machinery spares
- large pieces of vessel equipment, such as gangways, spare fishing gear, anchors
- cargo

use securing arrangements such as:

- lashing
- impounding
- patent securing arrangements

routines such as:

- sounding vessel tank and void space contents
- checking bilge levels
- checking cargo and equipment security
- checking cargo condition, for example, catch temperature.

Literacy skills used for:

reading safety rules and regulations.

Numeracy skills used for:

reading levels of tanks and void spaces

reading temperature monitoring devices

estimating safe working loads of rope and wire.

Critical aspects of evidence

Assessment must confirm the ability to secure the vessel when at anchor, moored and berthed and to contribute to ensuring continued security at all times; the ability to perform checks and transfer fluids in routine and emergency situations.

Ability to:

prepare anchor equipment for operation
control anchor equipment during operation
secure anchoring equipment on completion of operations
progress mooring operations to completion
securing mooring area on completion of operations
identify malfunction or possible problems and the implementation of contingency plans
perform routing checks and inspections of vessel:

- security
- seaworthiness

secure the vessel
deal with security contingencies
report on conditions
monitor and control access.

Knowledge of:

safety rules and regulations during operation
procedures for entering dangerous spaces.

Interdependent assessment of units

This unit may be assessed with:

SFISHIP202A Contribute to safe navigation.

Context of assessment

Assessment is to be conducted at the workplace or in a simulated workplace environment.

Method of assessment

The following assessment methods are suggested:
written or oral short answer testing
practical exercises
project work
observation of practical demonstration.

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Resources required for assessment

Resources may include:

fully operational vessel with a range of anchoring, mooring and berthing arrangements available

a range of devices requiring security.

Key competencies

This refers to the seven areas of generic competency that underpin effective workplace practices. The Key Competencies cover the three levels of performance in the following areas:

Communicating ideas & information	Collecting, analysing & organising information	Planning & organising activities	Working with others and in teams	Using mathematical ideas and techniques	Solving problems	Using technology
Level 2	1	1	2	1	2	1

SFISHIP204A Maintain marine vessels and equipment

Functional area

Vessel operations

Prerequisite Unit/s: nil
Descriptor

This unit involves maintaining marine vessels and equipment, including wires, ropes, watertight fittings and safety equipment (life saving and fire fighting), using basic mechanical skills, and applying paint work and protective coatings.

Element of Competency	Performance Criteria
Plan maintenance	<p><i>Maintenance</i> requirements are defined by reference to the <i>type</i> of service required by specification</p> <p>Maintenance activities are planned according to technical, legislative and procedural specifications</p> <p>Activities are negotiated with <i>internal agencies</i> to complete the work requirements to schedule while minimising down time and disruption to production or work schedules.</p>
Carry out work to maintain and restore hull fabric and fittings	<p>Condition after repair, adaptation, service or replacement of <i>vessel component and/or equipment</i> is to <i>specification</i> and <i>government inspection requirements</i></p> <p>Variances to condition against specification are reported accurately and promptly according to enterprise procedures</p> <p>Indicators of contingencies and problems are identified and corrective action is instituted and negotiated with appropriate authority according to enterprise procedures</p> <p>Maintenance documentation is accurate and complete, filed and/or dispatched to appropriate person in accordance with enterprise requirements</p> <p>Variations to facilities and resources that are required to complete maintenance schedule are identified, rectified and reported in accordance with enterprise requirements</p> <p>Work practices, techniques and systems comply with specification and government requirements.</p>

Range of Variables

The Range of Variables places the competency in context and allows for differences between enterprises and workplaces, including practices, knowledge and requirements. The Range of Variables also provides a focus for assessment and relates to the unit as a whole. The following variables may be present.

Maintenance	<ul style="list-style-type: none"> • planned, for example, survey or preventative • breakdown • unplanned or reactive • periodic, for example, slipping and docking • continuous, for example, washing a vessel down at the completion of a trip.
Type	<ul style="list-style-type: none"> • cleaning • lubrication • replacement or repair of components • preparation for, and application of, protective coatings: <ul style="list-style-type: none"> external and internal watertight skin fittings • repair of fittings: <ul style="list-style-type: none"> deck and internal • rope work and wire work • routine tests, checks and inspections.
Internal agencies	<ul style="list-style-type: none"> • enterprise • crew.
Vessel component/equipment	<ul style="list-style-type: none"> • hull materials of steel, timber, aluminium or fibreglass or glass reinforced plastic (GRP) • paint work and protective coatings • watertight fittings and sealing arrangements: <ul style="list-style-type: none"> external and internal watertight skin fittings <ul style="list-style-type: none"> • collision bulkheads • pumping systems • pumping arrangements • deck machinery: <ul style="list-style-type: none"> • winches, hydraulic and electric • lifting plant components • flexible steel wire rope and synthetic fibre rope • life saving and fire fighting appliances.
Specification and government inspection requirements	<ul style="list-style-type: none"> • as defined by the: <ul style="list-style-type: none"> • maintenance plan • manufacturer • regulatory requirements • vessel design.

Evidence Guide

Each unit of competency has an Evidence Guide that relates directly to the Performance Criteria and the Range of Variables. Its purpose is to guide assessment of the unit in the workplace and/or training program. The following components provide information to assist this purpose.

Underpinning knowledge

The underpinning knowledge identified for this unit goes into more depth due its likely inclusion in a group of units that may be used as the basis for the issue of licences by regulatory bodies.

The essential knowledge and understanding a person needs to perform work to the required standard includes:

- areas of responsibility of personnel the maintenance will affect
- construction and method of operation of the various watertight fittings and sealing arrangements
- component tasks necessary to complete all forms of maintenance across the range
- relevant sections of codes of safe working practice
- requirements for tests and inspections
- particular hazards associated with the maintenance being undertaken, for example, entering enclosed spaces, or applying chemicals
- machinery isolation procedures
- overhaul procedures.

Practical skills

The essential skills a person needs to perform work to the required standard include:

- applying coatings:
 - brush
 - roller
 - air spray
 - airless spray
- preparing the surface:
 - shot blasting
 - mechanical scaling
 - hand scaling
- lubricating:
 - oils and greases for moving parts
 - protection from the environment to lubrication schedules
- carrying out rope work and wire work:
 - repair of running and standing rigging
 - mooring ropes
 - gant lines and safety lines
 - access equipment
 - slings, nets and other lifting equipment
 - knotting, splicing, seizing, whipping
- conducting tests, checks and inspections:
 - statutory and organisational requirements
 - rectification of minor faults found

- maintenance in excess of recommended minimum frequency
- as required by safety of life at sea convention
- using packing and jointing:
 - re-packing a valve on a work bench or in situ
 - jointing of all sizes of pipe work on board the vessel
 - packing on hatches
 - water tight doors
 - access covers to tanks
 - vent and fan flaps
 - items that maintain water tight integrity
- operating, using, caring and storing electrically or pneumatically operated power tools safely:
 - pistol drills
 - rotary grinders
 - mechanical scaling equipment
 - high pressure equipment
- operating and using hand tools safely:
 - spanner/wrench
 - files
 - hacksaws including blade replacement
 - chisels and nut splitters
 - screw drivers, pliers, tin snips
 - bell punches, packing knives and packing extractors
 - scrapers and other abrasive materials
 - wood working tools
- adopting safe working practices:
 - protective clothing
 - guarding machinery isolation
 - entry into enclosed spaces.

Literacy skills used for:

- reading and using maintenance schedules
- reading and following safety rules and regulations
 - from marine safety authorities
 - industry or enterprise codes of safe working practice
 - from manufacturer's material safety data sheets.

Critical aspects of evidence

Assessment must confirm the ability to perform general vessel maintenance. This includes the ability to maintain wires, ropes, watertight fittings and safety equipment (life saving and fire fighting) and to apply basic mechanical skills, paint work and protective coatings.

Ability to:

- identify component tasks
- plan the execution of component tasks
- communicate with other personnel and departments affected by maintenance
- identify and report product at variance from specification with routine checks, tests and

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SFSHIP204A Maintain Marine Vessels and Equipment

inspections

- complete maintenance to specification within and outside the planned maintenance schedule
- maintain documentation.

Knowledge of:

- planned maintenance
- hazards associated with the maintenance.

Interdependent assessment of units

This unit may be assessed after/with:

- nil.

Context of assessment

Assessment is to be conducted at the workplace or in a simulated workplace environment.

Method of assessment

The following assessment methods are suggested:

- written or oral short answer testing
- practical exercises
- project work
- observation of practical demonstration.

Resources required for assessment

Resources may include:

- working vessel with a range of maintenance requirements
- workshop containing a range of vessel components that require maintenance
- complete range of tools and facilities listed to complete the maintenance
- maintenance schedules.

Key competencies

This refers to the seven areas of generic competency that underpin effective workplace practices. The Key Competencies cover the three levels of performance in the following areas:

Communicating ideas & information	Collecting, analysing & organising information	Planning & organising activities	Working with others and in teams	Using mathematical ideas and techniques	Solving problems	Using technology
Level 2	2	2	2	1	1	2

SFISHIP205A Maintain marine plant

Functional area

Vessel operations

Prerequisite Unit/s: nil
Descriptor

This unit involves routinely maintaining, restoring and repairing mechanical plant on board a vessel according to maintenance plans and instructions or as a result of an unacceptable or unscheduled variation. This unit also covers actions required to maintain a vessel in survey.

Element of Competency	Performance Criteria
<p>Comply with requirements for survey</p>	<p>4.20 1.1 Complete inventory survey documentation is maintained and accessible to appropriate authorities</p> <p>4.21 1.2 Applications for renewal of and extensions to certification are timely and ensure continuous validity</p> <p>4.22 1.3 State of survey items and equipment (with respect to certificate conditions) reflect continuing effective programs of tests, check and maintenance</p> <p>4.23 1.4 Arrangements made for survey are timely and comply with organisational and issuing authority requirements</p> <p>4.24 1.5 Survey certification reflects adherence to procedures where validity may be affected by damage, alterations or additions to the vessel or equipment.</p>
<p>Determine the sequence of work required to restore and maintain mechanical plant</p>	<p>Defined work sequence is according to the overall <i>maintenance plan specification</i></p> <p>Maintenance activities are correctly planned according to technical, legislative and procedural specifications</p> <p>Sequence and scope of the planned work is complete and within the <i>requirements</i> of agreed time scales</p> <p>Activities are negotiated with internal agencies to complete the work requirements to schedule, minimise downtime and reduce disruption to production schedules</p> <p>Anticipation of <i>restrictions and variances</i> to work schedules are realistic and made at appropriate times</p> <p>4.25 2.6 Action planned leads to the restoration of plant by the most suitable method consistent with available resources.</p>
<p>Prepare work area and resources for engineering maintenance</p>	<p>Equipment and materials selected are safe, serviceable and of the correct type and quantity required to carry out the tasks</p> <p>Restrictions and variances to resources are accurately identified, promptly recorded and reported according to relevant <i>legislative and enterprise</i> requirements</p> <p>Material and equipment are safely handled, stored and secured</p>

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	<p>according to relevant legislative and enterprise requirements</p> <p>Work area, machinery and equipment are confirmed as <i>safe</i> for work to proceed and comply with relevant environmental, legislative and enterprise requirements</p> <p>Work area is accessible and free from obstruction for receiving and storing materials and resources needed for the work to proceed</p> <p>Specifications, plans, materials and equipment appropriate to the task are available at the enterprise according to schedule.</p>
<i>Service and maintain mechanical systems to schedule</i>	<p>Maintenance is carried out according to established safety rules and regulations</p> <p>Sequence and scope of work conforms to routine maintenance and servicing plans and schedules</p> <p>Equipment and components are correctly cleaned and prepared for the required inspection or maintenance to be carried out</p> <p><i>Variance</i> from plans and schedules is agreed prior to continuing</p> <p><i>Settings</i> are accurate and complete to specification</p> <p>Static checks and tests are completed satisfactorily to statutory regulations and technical requirements</p> <p>Work practices and techniques ensure completion of activity to specification, within an acceptable time frame.</p>
<i>Rectify unacceptable or unscheduled variation to mechanical plant</i>	<p>Maintenance is planned and carried out in accordance with established safety rules and regulations</p> <p>Procedures and equipment for dismantling and reassembly conform to <i>technical specification</i> and agreed work plan</p> <p>Dismantled parts are safely and correctly stored, handled and cleaned</p>

Appropriate method for restoring equipment or systems is selected, taking identified operational and physical *constraints* into account

Defective parts are repaired economically and to defined standards using correct engineering practices

Replacement parts meet system and equipment manufacturer's specifications

Product and components are restored to specification within the agreed time schedules and quality requirements

Static checks and tests are correctly completed to statutory regulations and technical requirements.

Range of Variables

The Range of Variables places the competency in context and allows for differences between enterprises and workplaces, including practices, knowledge and requirements. The Range of Variables also provides a focus for assessment and relates to the unit as a whole. The following variables may be present.

Specification	master schedule breakdown procedures planned maintenance unplanned maintenance.
Requirements	preparation of the work area preparation of resources preparation of the plant carrying out and completing restoration or maintenance.
Restrictions and variances	caused by: other maintenance operational requirements resources.

Maintenance

of marine mechanical plant and systems including:
propulsion plant
auxiliary machinery
service systems, LPG and fire hose including
associated pipework and fittings
techniques for scheduled maintenance and servicing
including:
replacement of consumables
minor adjustments
replacement of faulty components
operational changeovers
survey requirements:
steering gear check
fire extinguisher, water based
techniques for restoration including:
repair
recondition
replace
dismantle
construct
fabricate
insulate.

Prepare

and select:

- resources
- materials
- tools
- equipment
- documentation
- emergency services and equipment

the work area including:

- access
- lighting
- atmosphere
- lifting plant
- machinery
- isolation
- machinery preparation
- provision of alternative services

by ensuring the serviceability of:

- equipment
- tools
- machinery.

<p>Legislative and enterprise requirements</p>	<p>marine safety regulations code of safe working practices protective clothing and equipment guarding of machinery safe movement on board ship hatches and lifting plant.</p>
<p>Safe</p>	<p>by recognition of hazards to:</p> <ul style="list-style-type: none"> • personnel • plant • environment.
<p>Service and maintain</p>	<p>scheduled checks tests measurements and inspections replacement of consumables minor adjustments replacement of lifed components.</p>
<p>Variance</p>	<p>methods and techniques consumables components.</p>
<p>Settings</p>	<p>torques tension clearances adjustable control inputs and outputs.</p>
<p>Technical specifications</p>	<p>statutory requirements manufacturer's plans and drawings manufacturer's manuals supervisor's instructions.</p>
<p>Constraints</p>	<p>equipment design equipment position safety requirements availability of spares operational requirements for the equipment economical restraints.</p>

Evidence Guide

Each unit of competency has an Evidence Guide that relates directly to the Performance Criteria and the Range of Variables. Its purpose is to guide assessment of the unit in the workplace and/or training program. The following components provide information to assist this purpose.

Underpinning knowledge

The underpinning knowledge identified for this unit goes to some depth due to its likely inclusion in a group of units that may be used as the basis for the issue of licences by regulatory bodies.

The essential knowledge and understanding a person needs to perform work to the required standard includes:

maintenance objectives, priorities vessel and company maintenance plans

legislation relating to work methods and occupational health and safety

acceptable work rates and time scales

how proposed preparation will affect other personnel, equipment and departments

function of the component/system to be maintained and the affect it has on related components/systems

principles and methods relating to:

establishing a safe working environment

use of resources during maintenance

quality assurance and control

communicating with personnel on status of work

information relating to:

work objectives

acceptable types of work methods

how particular maintenance activities will affect other personnel, equipment or departments

current methods of preparation

factors which may cause preparations to be disrupted and contingency measure to deal with them

anticipated time scales

systems for monitoring effectiveness of work

survey requirements

compliance with procedures relating to survey and validation of certification including seeking extension

sources of information on detailed survey and certification requirements

company procedures for survey and validation of certification including seeking extension.

Practical skills

The essential skills a person needs to perform work to the required standard include:

- preparing and carrying out maintenance on mechanical plant and systems incorporating pipework and all mechanical components including:
 - prime movers and associated systems
 - hydraulic systems
 - compressed air systems
 - refrigerant systems
 - lubrication systems
 - fuel systems
 - water systems
 - flammable gas systems
 - deck machinery
 - safety equipment and fixed systems
- preparing and carrying out maintenance on marine engineering systems including:
 - mechanical equipment and systems
 - electrical generation transmission systems
 - electronic equipment
 - control and instrumentation.

Literacy skills used for:

- reading manufacturers' technical information
- reading and recording operating parameters
- reading and producing reports for company and authorities
- reading statutory regulations.

Critical aspects of evidence

Assessment must confirm the ability to plan and carry out maintenance and repairs to mechanical plant onboard a vessel to ensure that the vessel remains operational and in survey.

- check completeness and validity of documentation
 - ensure maintenance of survey items and arrangements for survey
- identify requirements from schedule
plan activities to meet requirements
identify restrictions to maintenance
correctly choose and handle equipment and materials
prepare the work area and resources
carry out pre commissioning tests and inspections

Knowledge of:

efficiency of various methods
safe procedures
alternative work activities.

Interdependent assessment of units

This unit may be assessed after/with:

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nil.

Context of assessment

Assessment is to be conducted at the workplace or in a simulated workplace environment.

Method of assessment

The following assessment methods are suggested

written or oral short answer testing
practical exercises
project work
observation of practical demonstration.

Resources required for assessment

Resources may include:

- operational machinery and equipment
- service equipment and maintenance instructions
- operation procedures and policies
- safety equipment
- spares and consumables
- maintenance tools and equipment.

Key competencies

This refers to the seven areas of generic competency that underpin effective workplace practices. The Key Competencies cover the three levels of performance in the following areas:

Communicating ideas & information	Collecting, analysing & organising information	Planning & organising activities	Working with others and in teams	Using mathematical ideas and techniques	Solving problems	Using technology
Level 2	2	2	2	2	2	2

SFISHIP206A • Operate a small vessel

Functional area

Vessel operations

Prerequisite Unit/s: SFISHIP212A Take emergency action on board a vessel
Descriptor

This unit involves preparing, operating, maintaining, storing and securing small vessels within range of ready assistance and isolated from heavy boating traffic and navigational hazards. The operation is restricted to the basic use, manoeuvring and loading of the vessel, but not the interaction of the vessel with boat traffic or other hazards.

To assume control of an outboard powered dinghy, competence must be demonstrated in the unit SFISHIP207A Operate and maintain outboard motors.

Element of Competency	Performance Criteria
5. 1.	<p>5.26 1.1 Planned work activities accord with enterprise policies and procedures</p> <p>5.27 1.2 <i>Factors</i> that may compromise vessel safety are identified and addressed in the <i>work plan</i> and the operation of the vessel</p> <p>5.28 1.3 All essential <i>safety equipment and spares</i> required for area of operation and intended work are checked for presence and serviceability</p> <p>5.29 1.4 Vessel is loaded in accordance with manufacturer's specifications and enterprise procedures.</p>
6. 2.	<p>6.30 2.1 Vessel stability is maintained within safety limits by establishing a low center of gravity and securing and stowing <i>loads</i></p> <p>6.31 2.2 Vessel is operated at all times according to <i>government requirements</i> and enterprise procedures and in area of operation confined to <i>limits</i> of restricted area</p> <p>6.32 2.3 Vessel is <i>manoeuvred</i> safely using appropriate means to complete planned work <i>tasks</i></p>
7. 3.	<p>7.33 3.1 Vessel is secured, <i>maintained</i> and stored after use according to enterprise procedures</p> <p>3.2 Perishables and fuels are stored to minimise wastage, spoilage, environmental and fire hazards</p> <p>7.34 3.3 Unserviceable equipment and spares are repaired or removed for repair or replacement according to enterprise procedures.</p>

Range of Variables

The Range of Variables places the competency in context and allows for differences between enterprises and workplaces, including practices, knowledge and requirements. The Range of

Variables also provides a focus for assessment and relates to the unit as a whole. The following variables may be present.

Factors	<p>sea condition: wave height chop effect of current direction on wave height</p> <p>visibility: fog rain low light conditions</p> <p>operational limits navigational hazards fire.</p>
Work plan	<p>ability to make safe havens: mother ship shore alternative sources of propulsion</p> <p>ability to remove water from the vessel by: bailing bilge pump removing the drainage plug while planing</p> <p>ability to use alternative steering.</p>
Safety equipment and spares	<p>communications equipment bailing or bilge pumping arrangements fire extinguishers personal floatation devices alternative sources of propulsion and steering anchoring devices bilge removal systems distress signaling devices: flares, flags, emergency position indicating radio beacon (EPIRB), other methods</p> <p>water tools and spare parts torch and batteries.</p>
Loads	<p>distribution and securing procedures passengers catch cargo: fishing gear diving equipment oyster farm equipment aquaculture nets and gear stock feed monitoring equipment.</p>

Government requirements	relevant local, state/territory and Commonwealth legislation, regulations and orders.
Limits	distance from supervision distance from safe haven operational limits speed limits sectors proximity to dangers range of fuel tank.
Manoeuvred	using outboard motor using oars alternative steering.
Tasks	berthing unberthing anchoring, sea anchoring reversing maneuvering in confined areas or heavy seas towing approaching a beach or landing recovering person overboard.
Maintained	by controlling: corrosion hull fractures and fatigue hull damage cleanliness.

Evidence Guide

Each unit of competency has an Evidence Guide that relates directly to the Performance Criteria and the Range of Variables. Its purpose is to guide assessment of the unit in the workplace and/or training program. The following components provide information to assist this purpose.

Underpinning knowledge

The underpinning knowledge identified for this unit goes into more depth due to its likely inclusion in a group of units that may be used as the basis for the issue of licences by regulatory bodies.

The essential knowledge and understanding a person needs to perform work to the required standard includes:

vessel loading specifications and the location of this information
effect of load distribution on centre of gravity
impact of wind and current on sea conditions and the effect on dinghies
effect of a shift in cargo on stability.

Practical skills

The essential skills a person needs to perform work to the required standard include:

making an adequate stability assessment prior to loading
minimising free surface effect
manoeuvring small vessels using a range of propulsion techniques
sea survival, fire fighting and first aid techniques.

Literacy skills used for:

reading manufacturer's operational and loading specification and the use by date of flares
reading manufacturer's period of validity of pyrotechnics.

Critical aspects of evidence

Assessment must confirm the ability to manoeuvre, load, and operate a small vessel.

Ability to:

manoeuvre a small vessel while engaged in common tasks
ensure the vessel remains within operational limits.

Knowledge of:

effect of overloading and poor stability practices
effect of sea state on vessel performance
pre-operational checks of propulsion system, dinghy and safety equipment.

Interdependent assessment of units

This unit may be assessed with:

SFISHIP207A Operate and maintain outboard motors
but after:

SFISHIP212A Take emergency action on board a vessel.

Context of assessment

Assessment is to be conducted at the workplace or in a simulated workplace environment.

Metal and Engineering Training Package

SFSHIP206A Operate a Small Vessel

Method of assessment

The following assessment methods are suggested:

written or oral short answer testing
practical exercises
project work
observation of practical demonstration.

Resources required for assessment

Resources may include:

fully operational vessel powered by an outboard motor.

Key competencies

This refers to the seven areas of generic competency that underpin effective workplace practices. The Key Competencies cover the three levels of performance in the following areas:

Communicating ideas & information	Collecting, analysing & organising information	Planning & organising activities	Working with others and in teams	Using mathematical ideas and techniques	Solving problems	Using technology
Level 1	1	1	1	1	1	2

SFISHIP207A . Operate and maintain outboard motors

Functional area

Vessel operations

Prerequisite Unit/s: SFISHIP212A Take emergency action on board a vessel

Descriptor

This unit involves operating and maintaining outboard motors and diagnosing and rectifying basic faults when in isolated situations.

Element of Competency	Performance Criteria
Operate outboard motors	<p><i>Pre-start checks</i> are performed on the motor</p> <p>Outboard motors are <i>started</i> and stopped according to the engine manufacturer's instructions</p> <p>Outboard motor <i>controls</i> are used to maneuver a dinghy both ahead and astern, and port and starboard</p> <p>Outboard motor cooling systems are <i>checked</i> for operation according to manufacturer's recommendations</p> <p>Trim and tilt mechanisms are operated according to manufacturer's instructions.</p>
Maintain outboard motors	<p>Fuel filters are changed and <i>fuel quality</i> is maintained according to manufacturer's instructions</p> <p><i>Electrical systems</i> are maintained to ensure reliable electrical supply to the outboard motor</p> <p>Sea water is flushed from the internal and external parts of the outboard motor using the appropriate tools and fresh water, keeping water away from sensitive equipment</p> <p>Engine and gearbox oil is checked and changed and lubrication is applied according to manufacturer's instructions</p> <p>Engine mounting gear is secured and checked as necessary.</p>
Identify and rectify basic outboard motor faults	<p>Operating difficulties caused by fuel-related factors are identified and rectified where possible according to trouble shooting guides and manufacturer's instructions</p> <p>Electrical faults are identified and rectified according to trouble shooting guides and manufacturer's instructions</p> <p>Outboard engines that were immersed are serviced according to manufacturer's instructions</p> <p>Outboard motor <i>propulsion faults</i> are identified and rectified according to manufacturer's instructions.</p>

Range of Variables

The Range of Variables places the competency in context and allows for differences between enterprises and workplaces, including practices, knowledge and requirements. The Range of Variables also provides a focus for assessment and relates to the unit as a whole. The following variables may be present.

Pre-start checks	<ul style="list-style-type: none"> • amount of fuel in the fuel tank • appropriate fuel • water depth • cooling water intake submerged • motor attachment points • fuel hose connected, full and free of constrictions • fuel tank depressurised.
Started	<ul style="list-style-type: none"> • pull start • electric start.
Controls	<ul style="list-style-type: none"> • remote throttle and gear levers • tiller • steering wheel • tilt and trim mechanisms.
Checked	<ul style="list-style-type: none"> • cooling water circulation indicator • temperature gauge • temperature warning sound.
Fuel quality	<ul style="list-style-type: none"> • by estimating fuel consumption at turning points • contamination • fuel/oil ratio • filter type and quality.
Electrical systems	<ul style="list-style-type: none"> • batteries: charge rate capacity • fuses • spark plugs.
Propulsion faults	<ul style="list-style-type: none"> • bent or broken propeller • broken shear pin or drive spline • fouling • pitch.

Evidence Guide

Each unit of competency has an Evidence Guide that relates directly to the Performance Criteria and the Range of Variables. Its purpose is to guide assessment of the unit in the workplace and/or training program. The following components provide information to assist this purpose.

Underpinning knowledge

The essential knowledge and understanding a person needs to perform work to the required standard

Metal and Engineering Training Package

SFSHIP207A Operate and Maintain Outboard Motors

includes:

- outboard motor fuel systems
- outboard motor cooling systems
- outboard motor lubrication systems
- battery connection
- trouble shooting
- International Convention for the Prevention of Pollution from Ships (MARPOL) requirements.

Practical skills

The essential skills a person needs to perform work to the required standard include:

- checking, operating and maintaining an outboard motor that is used to propel a small vessel.

Literacy skills used for:

- reading trouble shooting charts
- reading manufacturers' instruction manuals.

Numeracy skills used for:

- calculating fuel to oil ratios or using tables to find and add correct volume of lubricating oil
- estimating fuel consumption and time at turning points.

Metal and Engineering Training Package

SFSHIP207A Operate and Maintain Outboard Motors

Critical aspects of evidence

Assessment must confirm the ability to operate and maintain outboard motors and be able to diagnose and rectify basic faults when in isolated situations.

Ability to:

- start and stop an outboard motor
- operate all controls on an outboard motor to propel a dinghy ahead and astern
- perform basic maintenance on an outboard motor
- store an outboard motor.

Knowledge of:

- indicators of engine faults.

Interdependent assessment of units

This unit may be assessed with:

- SFISHIP206A Operate a small vessel
but after:
- SFISHIP212A Take emergency action on board a vessel.

Context of assessment

Assessment is to be conducted at the workplace or in a simulated workplace environment.

Method of assessment

The following assessment methods are suggested

- written or oral short answer testing
- practical exercises
- project work
- observation of practical demonstration.

Resources required for assessment

Resources may include:

- fully operational small vessel powered by an outboard motor
- remote steering and controls.

Metal and Engineering Training Package

SFSHIP207A Operate and Maintain Outboard Motors

Key competencies

This refers to the seven areas of generic competency that underpin effective workplace practices. The Key Competencies cover the three levels of performance in the following areas:

Communicating ideas & information	Collecting, analysing & organising information	Planning & organising activities	Working with others and in teams	Using mathematical ideas and techniques	Solving problems	Using technology
Level 1	1	1	1	1	1	2

SFISHIP208A • Operate low powered diesel engines

Functional area

Vessel operations

Prerequisite Unit/s: nil
Descriptor

This unit involves routinely operating low powered diesel engines within normal parameters.

Element of Competency	Performance Criteria
8. 1.	<p>8.35 1.1 <i>Operations</i> are planned and carried out according to established <i>safety rules and regulations</i></p> <p>8.36 1.2 Timing and degree of preparation of engine and systems is appropriate to the intended operation and complies with operating instructions</p> <p>8.37 1.3 Sequence and timing of start up and shut down of engine and systems meets the requirements for safe and efficient operation</p> <p>8.38 1.4 <i>Engine parameters</i> and instrument readings are maintained within defined levels during start up and shut down operations</p> <p>8.39 1.5 Deviations from the norm are promptly identified, rectified and reported</p> <p>8.40 1.6 Adjustments made achieve a safe and efficient operation and are within the role holder's responsibility</p> <p>8.41 1.7 Sufficient notice of operations is given to enable other relevant personnel to carry out their responsibilities safely and efficiently</p> <p>8.42 1.8 Inability to start up or shut down engine as required is reported promptly and accurately to an appropriate authority.</p>
9. 2.	<p>9.43 2.1 Operations are planned and carried out according to established safety rules and regulations</p> <p>9.44 2.2 Engine is monitored according to <i>schedules</i>, operating parameters and instructions</p> <p>9.45 2.3 Engine system condition is assessed accurately in light of information available from local/remote indicators and physical inspection</p>

<p>10.</p>	<p>10.46 2.4 Engine output meets notified demand conditions throughout normal operation</p> <p>10.47 2.6 Engine parameters are maintained within defined limits during normal running</p> <p>10.48 2.7 Sequence and timing of adjustments to engine is that required for optimum safety and efficiency in achieving the desired condition</p>
<p>11. 3.</p>	<p>11.49 3.1 Deviations from the norm are correctly identified, rectified and reported</p> <p>11.50 3.2 <i>Action</i> taken in the event of irregularities, defects and damage is appropriate to their significance and optimises the safety and efficiency of operations.</p>

Range of Variables

The Range of Variables places the competency in context and allows for differences between enterprises and workplaces, including practices, knowledge and requirements. The Range of Variables also provides a focus for assessment and relates to the unit as a whole. The following variables may be present.

<p>Operations</p>	<ul style="list-style-type: none"> • start up and shut down of engine as a routine with the system functioning correctly • emergency shut down to minimise damage • operate under direct instruction for malfunctioning engine system • manual adjustment of controls to correct minor deviation • monitoring of remote operation • fuelling and lubrication requirements are met.
<p>Safety rules and regulations</p>	<ul style="list-style-type: none"> • code of safe working practices • enterprise's occupational health and safety procedures.
<p>Engine</p>	<ul style="list-style-type: none"> • diesel engines burning diesel oil or marine diesel oil • as the power source for the propulsion of the vessel • as the power source for an auxiliary system.
<p>Parameters</p>	<ul style="list-style-type: none"> • pressure • levels • flow • temperature • speeds.

Monitoring	<ul style="list-style-type: none">• frequency• scope• timing• checks• tests• inspections• fuel requirements.
Schedules	<ul style="list-style-type: none">• parameters and instructions• manufacturers information• enterprise requirements• onboard management requirements.
Action	<ul style="list-style-type: none">• to be taken in the event of irregularities includes:<ul style="list-style-type: none">– informing authority– adjustment of engine and systems– appropriate investigative techniques and safety procedures– fuel and lubrication transfer contained and disposed meeting International Convention for the Prevention of Pollution from Ships (MARPOL) requirements.

Evidence Guide

Each unit of competency has an Evidence Guide that relates directly to the Performance Criteria and the Range of Variables. Its purpose is to guide assessment of the unit in the workplace and/or training program. The following components provide information to assist this purpose.

Underpinning knowledge

The underpinning knowledge identified for this unit goes into more depth due its likely inclusion in a group of units that may be used as the basis for the issue of licenses by regulatory bodies.

The essential knowledge and understanding a person needs to perform work to the required standard includes:

- information relating to:
 - engine and system operating instructions
 - operating parameters and values
 - alarm and emergency shut down parameter values

Metal and Engineering Training Package

SFSHIP208A Operate Low Powered Diesel Engines

- different types of diesel engines and their variations likely to be encountered
- government requirements affecting operations and International Convention for the Prevention of Pollution from Ships (MARPOL) compliance
- method of operation of control systems
- procedures relating to:
 - sequence and timing of operations and adjustments
 - response to alarms and emergencies affecting engines including contingency plans
 - fuel isolation procedures and likely hazards.
- principles relating to:
 - operation of marine diesel engines sufficient to recognise malfunction, implement initial corrective action and seek advice
 - engineering science to appreciate the reasons for the method of safe operations.

Practical skills

The essential skills a person needs to perform work to the required standard include:

- operating high, medium and slow speed diesel engines including the associated systems:
 - fuel, such as diesel oil or marine diesel oil
 - cooling
 - lubrication
 - purification, transfer and storage
 - control
 - starting and stopping
 - battery power generation and use.
- carrying out the start up from both warm and cold conditions to standby or full operating condition including pre- and post-start up checks
- carrying out emergency shut down and normal shut down for short and long term periods including checks and isolation to organisational requirements
- operating the engine in various modes including:
 - monitoring and setting restrictions on remote operation
 - local manual operation
- emergency modes of operation
- monitoring aspects of the engine and system condition including:
 - pressure
 - flows
 - temperatures
 - levels
 - speeds
 - vibrations
 - expansion
 - emissions
 - abnormalities.

Metal and Engineering Training Package

SFSHIP208A Operate Low Powered Diesel Engines

Literacy skills used for:

- reading manufacturer's technical information
- reading and recording operating parameters
- reading and producing reports for enterprise and authorities
- reading statutory regulations.

Numeracy skills used for:

- reading pressure, temperature and levels.

Critical aspects of evidence

Assessment must confirm the ability to operate, start up and shut down low powered diesel engines and respond appropriately to irregularities.

Assessment must also confirm ability to:

- ensure that preparations for the operations are complete
- start up, shut down, monitor and operate engines in a safe manner
- maintain steady running of the engine and comply with alarm acceptance procedures
- carry out adjustment and regulation of engine
- carry out alteration of output as required.

Knowledge of:

- contingency actions to be taken
- implementation of emergency response
- process of seeking advice and informing management.

Interdependent assessment of units

This unit may be assessed after/with:

- SFISHIP210A Operate marine plant and systems
- SFISHIP205A Maintain marine plant.

Context of assessment

Assessment is to be conducted at the workplace or in a simulated workplace environment.

Metal and Engineering Training Package

SFSHIP208A Operate Low Powered Diesel Engines

Method of assessment

The following assessment methods are suggested:

- written or oral short answer testing
- practical exercises
- project work
- observation of practical demonstration.

Resources required for assessment

Resources may include:

- operational diesel engine and system
- operation procedures and policies.

Key competencies

This refers to the seven areas of generic competency that underpin effective workplace practices. The Key Competencies cover the three levels of performance in the following areas:

Communicating ideas & information	Collecting, analysing & organising information	Planning & organising activities	Working with others and in teams	Using mathematical ideas and techniques	Solving problems	Using technology
Level 1	1	1	1	2	1	2

SFISHIP209A . Operate marine communications equipment

Functional area

Vessel operations

Prerequisite Unit/s: nil
Descriptor

This unit involves using radiotelephony equipment, the global maritime distress and safety sub-systems (GMDSS) available for small commercial vessels, specifically digital selective calling (DSC), the emergency position indicating radio beacon (EPIRB) and the marine search and rescue system. This unit incorporates the competencies required for holding the 'Marine radio operators certificate of proficiency (MROCP)'.

Element of Competency	Performance Criteria
Transmit and receive communications with radiotelephony equipment	<p>Types of <i>radio equipment</i> are selected and used in accordance with their <i>limitations</i> and operational requirements</p> <p>Radiotelephony <i>procedures</i> are used to transmit and receive various <i>types of signal</i> with different types of equipment</p> <p><i>Regulations</i> applicable to ship stations equipped with radiotelephony and digital selective calling (DSC) facilities are obeyed.</p>
Repair and maintain communications equipment	<p>Fault finding <i>procedures</i> are used to identify and rectify defective radio equipment</p> <p>Routine maintenance is carried out on radio equipment.</p>
Access search and rescue facilities	<p>Access is made to the appropriate <i>organisation</i> for the provision of the required search and rescue <i>services</i></p> <p>Information required by the AUSREP (Australian ship reporting) system is supplied in the required format</p> <p><i>Emergency position indicating radio beacons (EPIRBs)</i> are deployed as required according to manufacturer's instructions and accepted search and rescue procedures.</p>

Range of Variables

The Range of Variables places the competency in context and allows for differences between enterprises and workplaces, including practices, knowledge and requirements. The Range of Variables also provides a focus for assessment and relates to the unit as a whole. The following variables may be present.

Radio equipment	<ul style="list-style-type: none"> • radiotelephony equipment: medium frequency / high frequency equipment (MF/HF) • very high frequency equipment (VHF) • digital selective calling (DSC) equipment • emergency position indicating radio beacon (EPIRB) • single battery • two batteries connected in series, parallel or in combination of the two • aerials • electrical and radio cable connections • electrical fuses and their current carrying capacity.
Limitations	<ul style="list-style-type: none"> • changes in transmission ability with time of day • line of sight • transmission power and geographic range • COSPAS-SARSAT availability.
Procedures	<ul style="list-style-type: none"> • as contained in the current 'Marine Radio Operators Handbook for Small Craft': fault finding power supply transceiver antenna • DSC formats • general voice procedures and phonetic alphabet • safety, urgency, alarm and distress formats • silence periods • appropriate frequencies.
Types of signal	<ul style="list-style-type: none"> • via COSPAS-SARSAT • straight line • via atmospheric layers • relayed between various organisations • general • public correspondence: stations accepting radiotelegrams and radiotelephone calls ship to shore radiotelephone calls on demand service auto seaphone service

	<p>auto seaphone 999 service</p> <ul style="list-style-type: none">• safety• urgency• alarm and distress.
Regulations	<ul style="list-style-type: none">• arising from federal communications legislation: <i>Australian Communications Authority Act 1997</i> <i>Radiocommunications Act 1992</i> <i>Telecommunications Act 1997</i> <i>Telecommunications (Transitional Provisions and Consequential Amendments) Act 1997.</i>
Organisations	<ul style="list-style-type: none">• search and rescue coordination centre location and operator• state police forces• coast stations• limited coast stations• fishing organisations and cooperatives• private shore stations• volunteer coast guard stations.
Services	<ul style="list-style-type: none">• medical advice• AUSREP• search and rescue• public correspondence.
Emergency position indicating radio beacons (EPIRBs)	<ul style="list-style-type: none">• of the type: 406MHz 121.5/243 MHz.

Evidence Guide

Each unit of competency has an Evidence Guide that relates directly to the Performance Criteria and the Range of Variables. Its purpose is to guide assessment of the unit in the workplace and/or training program. The following components provide information to assist this purpose.

Underpinning knowledge

The underpinning knowledge identified for this unit goes into more depth due to its likely inclusion in a group of units that may be used as the basis for the issue of licenses by regulatory bodies.

The essential knowledge and understanding a person needs to perform work to the required standard includes:

- principles of signal transmission in order to avoid equipment limitations
- methods of communicating vessel position
- purpose for and monitoring of calling and working frequencies
- purpose of silence periods
- limitations on different types of radio equipment
- a basic understanding of the Australian marine search and rescue system
- hazards associated with radio transmission and the repair and maintenance of equipment.

Practical skills

The essential skills a person needs to perform work to the required standard include:

- calling, replying and relaying procedures
- transmitting and decoding of the phonetic alphabet, excluding the figure code
- identifying different types of radio equipment
- measuring capacity of batteries and the specific gravity of the electrolyte
- measuring on and off load voltage.

Literacy skills used for:

- reading radio frequencies
- reading fuse capacity.

Numeracy skills used for:

- adjusting settings.

Critical aspects of evidence

Assessment must confirm the ability to operate and maintain the full range of radio equipment found aboard small vessels to send and receive routine and emergency signals.

Ability to:

- select frequencies appropriate for different types of signal transmission and reception
- use transceiver controls
- use message formats appropriate to general, safety, urgency, alarm and distress signals
- operate MF/HF and VHF radio equipment to transmit and receive signals
- test equipment and identify and rectify common faults occurring to radio equipment
- perform routine maintenance on radio equipment

Metal and Engineering Training Package

SFSHIP209A Operate Marine Communications Equipment

- deploy EPIRBs correctly
- take appropriate action on receipt of various signals
- access all services available from the various organisations listed
- transmit and decode messages with the phonetic alphabet, excluding the figure code.

Knowledge of:

- services available from organisations and the methods of accessing emergency and communications services
- authority to transmit and the circumstances of use of alarm and distress signals
- regulatory requirements covering:
 - ship station license
 - authority of skipper
 - secrecy of communications
 - false or deceptive distress or urgency signals
 - unnecessary transmissions
 - keeping a log
 - avoiding interference
 - ship station identification
 - information to be made available to coast stations
 - documentation to be kept on board
 - language to be used during transmission.

Interdependent assessment of units

This unit may be assessed after/with:

- nil.

Context of assessment

Assessment is to be conducted at the workplace or in a simulated workplace environment.

Method of assessment

The following assessment methods are suggested:

- written or oral short answer testing
- practical exercises
- project work
- observation of practical demonstration.

Resources required for assessment

Resources may include:

- fully operational radiotelephony equipment
- digital selective calling equipment
- equipment for assessing voice procedures
- equipment for assessing ability to identify and rectify faults with radio equipment and power supply
- EPIRBs
- radio communication simulation.

Key competencies

Metal and Engineering Training Package

SFSHIP209A Operate Marine Communications Equipment

This refers to the seven areas of generic competency that underpin effective workplace practices. The Key Competencies cover the three levels of performance in the following areas:

Communicating ideas & information	Collecting, analysing & organising information	Planning & organising activities	Working with others and in teams	Using mathematical ideas and techniques	Solving problems	Using technology
Level 2	2	1	1	2	2	2

SFISHIP210A • Operate marine plant and systems

Functional area

Vessel operations

Prerequisite Unit/s: nil
Descriptor

This unit involves routine starting up, running and shutting down of marine engineering plant and systems. This plant includes pumps, air and refrigeration compressors, fishing and cargo gear, electrical and hydraulic power generation and distribution plant and motors, steering gear and shafting associated with main propulsion system, reduction and power transfer gear associated with main propulsion and auxiliary systems.

Element of Competency	Performance Criteria
12. 1.	<p>12.51 1.1 Operations are planned and carried out according to established <i>safety rules and regulations</i></p> <p>12.52 1.2 Timing and degree of preparation of <i>plant</i> is appropriate to the intended operation and complies with <i>operating instructions</i></p> <p>12.53 1.3 Sequence and timing of start up or shut down of plant and systems are those required for safe and efficient operation</p> <p>12.54 1.4 Plant <i>parameters</i> and instrument readings are maintained within defined levels during start up and shut down operations</p> <p>12.55 1.5 Adjustments able to be made by the operator are identified and are executed to achieve a safe and efficient operation</p> <p>12.56 1.6 Notice of operations is given to enable other relevant personnel to carry out their responsibilities safely and efficiently</p> <p>12.57 1.7 Irregularities and malfunctions are promptly recognised and reported accurately to an appropriate person.</p>
13. 2.	<p>13.58 2.1 Operations are planned and carried out according to established safety rules and regulations</p> <p>13.59 2.2 Plant is monitored according to operating instructions</p> <p>13.60 2.3 Plant condition is assessed accurately in light of information available from local or remote indicators and physical inspection</p>
14.	<p>14.61 2.4 Plant output consistently meets notified demand throughout normal operation</p> <p>14.62 2.5 Plant parameters are maintained within defined limits during normal running</p>

	14.63 2.6	Sequence and timing of adjustments to plant is that required for optimum safety and efficiency in achieving a specified condition.
15. 3. Respond to irregularities	15.64 3.1	Irregularities, defects or damage are promptly recognised and the <i>action</i> taken maximises safety and is appropriate to the situation.

Range of Variables

The Range of Variables places the competency in context and allows for differences between enterprises and workplaces, including practices, knowledge and requirements. The Range of Variables also provides a focus for assessment and relates to the unit as a whole. The following variables may be present.

Operations	<ul style="list-style-type: none"> • routine start up and shut down of plant • manual adjustment of controls to correct minor problems
Safety rules and regulations	<ul style="list-style-type: none"> • monitoring of remote operation • action in the event of an emergency • meeting fuel requirements. • plant is operated according to: <ul style="list-style-type: none"> – occupational health and safety regulations – statutory regulations – enterprise policy and procedures.
Plant	<ul style="list-style-type: none"> • maintain output of: <ul style="list-style-type: none"> – pumps – air and refrigeration compressors – fishing and cargo gear – electrical power generation and distribution plant and motors – hydraulic power generation and distribution plant and motors – steering gear and shafting associated with main propulsion system – reduction and power transfer gear associated with main propulsion and auxiliary systems.

Operating instructions	<ul style="list-style-type: none">• operating instructions are correctly interpreted and adhered to including:<ul style="list-style-type: none">– manufacturer’s information– enterprise procedures– onboard management requirements– regulatory requirements are met.
Parameters	<ul style="list-style-type: none">• operating parameters are monitored and correctly interpreted:<ul style="list-style-type: none">– pressures– levels– flow– temperatures– speeds– fuel consumption rate.
Action	<ul style="list-style-type: none">• action to take in the event of an emergency:<ul style="list-style-type: none">– informing appropriate authority– adjustment of plant– shut down of plant.

Evidence Guide

Each unit of competency has an Evidence Guide that relates directly to the Performance Criteria and the Range of Variables. Its purpose is to guide assessment of the unit in the workplace and/or training program. The following components provide information to assist this purpose.

Underpinning knowledge

The essential knowledge and understanding a person needs to perform work to the required standard includes:

- information relating to:
 - plant operating instructions
 - operating parameter values
 - alarm and emergency shut down parameter values
 - regulations affecting operation (statutory and enterprise)
 - the International Convention for the Prevention of Pollution from Ships (MARPOL) requirements
- procedures relating to:
 - sequence and timing of operations
 - emergency shut down and procedures.

Metal and Engineering Training Package

SFSHIP210A Operate Marine Plant and Equipment

Practical skills

The essential skills a person needs to perform work to the required standard include:

- operating and monitoring marine power systems including:
 - hydraulic
 - electric
- operating pumping systems:
 - bilge
 - ballast
 - fire
 - cargo
 - fuel
 - fresh water
 - pumps
 - air and refrigeration compressors
 - fishing and cargo gear
 - electrical power generation and distribution plant and motors
 - hydraulic power generation and distribution plant and motors
 - steering gear and shafting associated with main propulsion system
- reduction and power transfer gear associated with main propulsion and auxiliary systems
- carrying out start up from hot, warm and cold conditions, including pre and post start checks, setting up of distribution and supply systems
- carrying out the emergency and normal shut down including checks and isolation to organisational requirements.

Literacy skills used for:

- reading manufacturers technical information
- reading and recording operating parameters
- reading and producing reports for company and authorities
- reading statutory regulations.

Numeracy skills used for:

- determining fuel, lubrication and water capacity and consumption rates.

Metal and Engineering Training Package

SFSHIP210A Operate Marine Plant and Equipment

Critical aspects of evidence

Assessment must confirm the ability to start up, run and shut down marine engineering plant and systems under normal operating conditions, and to identify deviations from normal performance or where conditions might require running plant and systems outside normal parameters.

Interdependent assessment of units

This unit may be assessed after/with:

- SFISHIP208A Operate low powered diesel engines
- SFISHIP205A Maintain marine plant.

Context of assessment

Assessment is to be conducted at the workplace or in a simulated workplace environment.

Method of assessment

The following assessment methods are suggested:

- written or oral short answer testing
- practical exercises
- project work
- observation of practical demonstration.

Resources required for assessment

Resources may include:

- operational plant and systems described
- service equipment and operating instructions
- operating procedures and policies.

Key competencies

This refers to the seven areas of generic competency that underpin effective workplace practices. The Key Competencies cover the three levels of performance in the following areas:

Communicating ideas & information	Collecting, analysing & organising information	Planning & organising activities	Working with others and in teams	Using mathematical ideas and techniques	Solving problems	Using technology
Level 1	1	1	1	2	1	2

SFISHIP211A . Prepare for maintenance

Functional area

Vessel operations

Prerequisite Unit/s: nil
Descriptor

This unit involves preparing resources and the work area for maintenance using safe and environmentally sound methods.

Element of Competency	Performance Criteria
Select and prepare resources	<p>Materials are to quantity and type as stated in work instruction</p> <p>Equipment selected is serviceable and of the type and quantity required to carry out the specific task</p> <p>Machine and equipment <i>preparation</i> procedures are carried out according to <i>government requirements and enterprise procedures</i></p> <p>Restrictions and variances to <i>resources</i> are accurately identified and promptly reported according to government requirements and enterprise procedures</p> <p>Material and equipment are handled, stored and secured according to government requirements and enterprise procedures.</p>
Identify and prepare the work area	<p>Work area, machinery and equipment are confirmed as being safe for <i>work</i> to proceed and comply with relevant environmental, government and enterprise requirements</p> <p>Work area is appropriate to the operational requirements of the work instruction</p> <p>Work area is accessible and free from obstruction for receiving and storing materials and resources needed for the work to proceed</p> <p>Specifications, containment strategies, plans, materials and equipment are available at the workplace according to schedule and enterprise requirements.</p>

Range of Variables

The Range of Variables places the competency in context and allows for differences between enterprises and workplaces, including practices, knowledge and requirements. The Range of Variables also provides a focus for assessment and relates to the unit as a whole. The following variables may be present.

Preparation	<ul style="list-style-type: none"> • of required consumables • of required equipment and tools • of relevant documentation including: <ul style="list-style-type: none"> legislative requirements storage requirements hazard recognition work specification work schedule • of the work area prior to commencing work including: <ul style="list-style-type: none"> access isolation warnings and barriers contingency equipment including containment devices.
Government requirements and enterprise procedures	<ul style="list-style-type: none"> relevant local, state/territory, Commonwealth legislation, regulations and orders enterprise procedures, such as occupational health and safety policies and procedures.
Resources	<ul style="list-style-type: none"> • necessary to progress the maintenance and deal with contingencies and emergencies.
Work	<ul style="list-style-type: none"> • maintenance of: <ul style="list-style-type: none"> steel work, both cleaning and preparation for, and application of, protective coatings wires and ropes life saving and fire fighting appliances lubrication of fittings and equipment packing of glands jointing of pipework.

Evidence Guide

Each unit of competency has an Evidence Guide that relates directly to the Performance Criteria and the Range of Variables. Its purpose is to guide assessment of the unit in the workplace and/or training program. The following components provide information to assist this purpose.

Underpinning knowledge

The underpinning knowledge identified for this unit goes into more depth due its likely inclusion in a group of units that may be used as the basis for the issue of licences by regulatory bodies.

The essential knowledge and understanding a person needs to perform work to the required standard includes:

- possible hazards likely to be encountered when preparing resources and the precautions necessary to minimise their effect
- ideal resources, their availability and acceptable alternatives
- hazards likely to be encountered when progressing maintenance and the resources necessary to minimise risk
- safety regulations and how they are applied on board vessels
- relevant sections of the code of safe working practice
- possible hazards associated with the work area
- possible hazards associated with equipment and machinery in the work area and the need to isolate systems
- familiarity with work place hazards including:
 - the environment
 - machinery and equipment in the area
 - tools and maintenance equipment
 - consumables
- knowledge of government requirements and enterprise safety at work rules and regulations including:
 - good vessel keeping practices
 - marine safety regulations
 - code of safe working practices
 - protective clothing and equipment
 - guarding of machinery
 - safe movement on board ship
 - entry into confined spaces
 - lifting equipment.

Practical skills

The essential skills a person needs to perform work to the required standard include:

carrying out maintenance of:

- steel work, both cleaning and preparation for, and application of, protective coatings
- wires and ropes
- life saving and fire fighting appliances

lubricating

packing

jointing

obtaining and preparing consumables for work including:

- paints
- solvents
- cleaning fluids and chemicals
- oils
- greases
- life saving and fire fighting appliances spares
- packing materials
- jointing materials

preparing equipment for work including:

- airless and air spray painting equipment
- shot blasting equipment
- water and chemical washing equipment
- personal protection equipment

preparing electrically or pneumatically operated power tools safely including:

- pistol drills
- rotary grinders
- mechanical scaling equipment
- high pressure equipment

selecting and preparing of hand tools including:

- spanners
- files
- hacksaws
- chisels and nut splitters
- screw drivers
- pliers
- tinsnips and guillotine
- wad punches
- packing knives and extractors
- scrapers and other abrasive materials
- woodworking tools

preparing storage requirements for:

- dismantled equipment and machinery necessary to progress work
- tools, equipment and consumables during maintenance

preparing documentation including:

- simple manuals
- plans

Metal and Engineering Training Package

SFSHIP211A Prepare for Maintenance

preparation instructions
personal protective advice
stock control documents
codes of practice
work instructions

preparing access and safety equipment including:

staging
bosuns' chairs
scaffolding and ladders
isolation of machinery, equipment and systems
erection of hazard warnings, barriers and safety equipment
positioning of contingency equipment.

Literacy skills used for:

reading manufacturer's technical information

- reading and producing reports for company and authorities
- reading statutory regulations.

Numeracy skills used for:

- reading and recording operating parameters.

Critical aspects of evidence

Assessment must confirm the ability to prepare resources and the work area to carry out maintenance on the vessel and its equipment.

Ability to:

prepare materials for work
prepare equipment for maintenance
prepare the equipment and/or area to be worked on to a suitable condition to commence maintenance
store resources and dismantled machinery and systems in the work area
prepare and collect reference material.

Knowledge of:

procedures to apply when resources vary from requirements
handling of resources.

Interdependent assessment of units

This unit may be assessed after/with:

nil.

Context of assessment

Assessment is to be conducted at the workplace or in a simulated workplace environment.

Method of assessment

The following assessment methods are suggested:

- written or oral short answer testing
- practical exercises
- project work
- observation of practical demonstration.

Resources required for assessment

Resources may include:

- operational machinery and equipment
- service equipment and maintenance instructions
- operation procedures and policies
- safety equipment
- spares and consumables
- maintenance tools and equipment.

Key competencies

This refers to the seven areas of generic competency that underpin effective workplace practices. The Key Competencies cover the three levels of performance in the following areas:

Communicating ideas & information	Collecting, analysing & organising information	Planning & organising activities	Working with others and in teams	Using mathematical ideas and techniques	Solving problems	Using technology
Level 1	1	1	1	2	1	1

SFISHIP212A . Take emergency action on board a vessel

Functional area

Vessel operations

Prerequisite Unit/s: **nil**
Descriptor

This unit involves responding to operational emergencies on board a vessel, including fire and vessel abandonment. Response would normally be under direct supervision of a ticketed/licensed vessel operator.

Element of Competency	Performance Criteria
Carry out emergency actions on board a vessel	<p>Mustering and evacuation procedures are followed as per instructions and in accordance with vessel standing orders and emergency requirements</p> <p>All survival equipment is immediately located and used/applied as per vessel emergency requirements and manufacturers instructions</p> <p>Participation in emergency drills complies with requirements of vessel standing orders and skipper.</p>
Respond to an emergency on board a vessel	<p>Action initially taken on becoming <i>aware</i> of an <i>emergency</i> conforms to the vessel's emergency procedures</p> <p>Evacuation, emergency main and auxiliary shut down and isolation procedures are implemented promptly</p> <p>Information given to assist internal and external emergency services is prompt, accurate, complete and clear</p> <p>Alarm is raised promptly using the most appropriate <i>alarm system</i> available.</p>
Fight fires on board a vessel	<p>Personal safety during <i>fire fighting</i> is maximised at all times</p> <p>Clothing and equipment are appropriate to the overall <i>requirements</i> of the emergency</p> <p>Timing and sequence of individual actions are appropriate to the overall requirements of the emergency and comply with instructions received</p> <p>Appropriate fire fighting medium is applied according to manufacturer's instructions and/or enterprise procedures</p> <p>15.65 3.5 Communications comply as closely as possible to recommended procedures as allowed by the circumstances.</p>
Maximise chances of survival at sea in the event of abandonment	<p>Procedures on identifying muster or abandonment signals comply fully with vessel emergency requirements</p> <p>Wearing of additional clothing and <i>survival equipment</i> complies with manufacturer's instructions and accepted <i>codes of practice</i></p>

Survival techniques used in the case of rapid abandonment make use of self reliance and initiative

Survival instructions from supervisory personnel are promptly and fully complied with

Preparations and *launching* of survival craft follow craft manufacturer's instructions

Survival positions adopted in water comply fully with those described in accepted codes of practice

Methods of *boarding* survival craft comply fully with those described in accepted codes of practice

Actions and management procedures taken on boarding survival craft maximise safety of self and others and comply with accepted codes of practice

Instructions from *rescue personnel* are fully complied with at all times.

Range of Variables

The Range of Variables places the competency in context and allows for differences between enterprises and workplaces, including practices, knowledge and requirements. The Range of Variables also provides a focus for assessment and relates to the unit as a whole. The following variables may be present.

Action	<ul style="list-style-type: none"> • includes: <ul style="list-style-type: none"> – emergency shut down and isolation of equipment and areas within the role holder's responsibility – notification to onboard personnel and external agencies – muster – preparation of gear in anticipation of a threat • taken in conditions of: <ul style="list-style-type: none"> – heavy weather or sea conditions – poor visibility.
Aware	<ul style="list-style-type: none"> • on discovering an emergency • on sounding or hearing an alarm signal or being informed of an emergency.

Emergencies	<ul style="list-style-type: none"> • fire • grounding • flooding • person over board • rescue and evacuation of injured or injured personnel • major mechanical damage • collision.
Alarm system	<ul style="list-style-type: none"> • verbal • automatic detection • bell.
Fire fighting	<ul style="list-style-type: none"> • attack and extinguish fire • control fire spread • monitoring stability and free surface effect when using water • using: <ul style="list-style-type: none"> – carbon dioxide, foam, dry chemical and water extinguishers – fire blankets – hoses and various nozzles for personal protection, extinguishing fire and boundary cooling – foam applicators – fixed systems – removal of fuel or heat source – boundary cooling techniques.
Requirements	<ul style="list-style-type: none"> • of fighting fires in: <ul style="list-style-type: none"> – accommodation spaces – machinery spaces – on open decks – in cargo spaces.
Survival	<ul style="list-style-type: none"> • personal sea survival • in various climates: <ul style="list-style-type: none"> – tropical – temperate – sub-polar • initial actions prior to and immediately after boarding • long term actions after clearing distress.
Survival equipment	<ul style="list-style-type: none"> • life jackets • exposure suits • immersion suits.

Codes of practice	<ul style="list-style-type: none"> • survival at sea manual.
Launching	<ul style="list-style-type: none"> • davit and hand launched inflatable life rafts • dinghies.
Boarding	<ul style="list-style-type: none"> • wet • dry • assisted • unassisted.
Rescue personnel arriving from	<ul style="list-style-type: none"> • aircraft • helicopters • rescue craft.

Evidence Guide

Each unit of competency has an Evidence Guide that relates directly to the Performance Criteria and the Range of Variables. Its purpose is to guide assessment of the unit in the workplace and/or training program. The following components provide information to assist this purpose.

Underpinning knowledge

The underpinning knowledge identified for this unit goes into more depth due its likely inclusion in a group of units that may be used as the basis for the issue of licenses by regulatory bodies.

The essential knowledge and understanding a person needs to perform work to the required standard includes:

- procedures for:
 - mustering and reporting
 - emergency shut down and isolation of plant, equipment and areas of responsibility
 - isolating fire areas
 - protecting survivors in survival craft
 - preserving body fluids
 - search and rescue around Australia
 - launching and inflating life rafts
 - survival management
- location of:
 - alarm points
 - first aid emergency equipment
 - all fire fighting equipment and the location and method of operating fixed system controls
 - personal survival aids and extra survival equipment and their use
- hazards associated with:
 - different types of fire and by products of combustion
 - choosing an incorrect extinguishing method different methods of fire fighting
 - extremes of heat and humidity
 - immersion
 - exposure to sea or weather
 - heat or cold

Metal and Engineering Training Package

SFISHIP212A Take Emergency Action Onboard a Vessel

- lack of nourishment
- different types of alarm signal
- type of information to be provided and to whom
- basic principles of survival
- equipment available in inflatable life rafts
- additional equipment that may be used in a life raft
- importance of regular training drills and the actions to take on discovering an emergency
- effective communication techniques
- techniques for maximising morale and the will to live.

Practical skills

The essential skills a person needs to perform work to the required standard include:

- using a range of fire extinguishers
- joining a life raft dry or wet
- righting an up turned life raft
- heat escape lessening positions.

Literacy skills used for:

- reading the survival at sea manual
- reading life raft launching instructions.

Critical aspects of evidence

Assessment must confirm the ability to deal with a range of emergencies encountered on board a small vessel, in particular fire on board a vessel, and the ability to maximise survival during abandonment.

Ability to:

- respond to a range of emergencies in various circumstances which are likely to be encountered on a small vessel, including deployment of life raft
- comply with procedures and contingency plans when:
 - discovering an emergency
 - being informed of an emergency
- take action to:
 - comply with muster procedures
 - rectify the situation within role holder's capability
 - raise the alarm
 - respond to emergency signals
 - minimise the chance of or deal with explosion.

Knowledge of:

- actions that may harm other personnel.

Interdependent assessment of units

This unit may be assessed with:

- FPPAID2A Administer first aid procedures.

Context of assessment

Assessment is to be conducted at the workplace or in a simulated workplace environment.

The ability to respond to emergencies will normally be demonstrated during onboard drills covering all components of reaction to emergencies involving:

- fire
- grounding
- flooding
- person over board
- rescue and evacuation of personnel
- major mechanical damage
- by demonstrating ability to:
 - respond to emergency signals
 - prepare for abandoning ship
 - comply with instructions
 - abandon ship
 - practice survival procedures after abandonment
 - select suitable clothing
 - apply appropriate fire fighting, and control techniques that limit the spread and duration of fire
 - use communication procedures.

Method of assessment

The following assessment methods are suggested:

- written or oral short answer testing
- practical exercises
- project work
- observation of practical demonstration.

Resources required for assessment

Resources may include:

- operational vessel in survey with all required fire fighting and survival equipment
- realistic emergency response simulator allowing the use of all equipment and procedures mentioned above.

Key competencies

This refers to the seven areas of generic competency that underpin effective workplace practices. The Key Competencies cover the three levels of performance in the following areas:

Communicating ideas & information	Collecting, analysing & organising information	Planning & organising activities	Working with others and in teams	Using mathematical ideas and techniques	Solving problems	Using technology
Level 2	2	2	2	1	2	1

SFISHIP302A • Command and control maneuvers

Functional area

Vessel operations

Prerequisite Unit/s: nil
Descriptor

This unit involves manoeuvring the vessel for berthing, mooring and anchoring operations, maneuvering during an emergency and crossing bars and sea entrances.

Element of Competency	Performance Criteria
<p>Manoeuvre the vessel for berthing, mooring and anchoring operations</p>	<p><i>Manoeuvres</i> are made to safely progress the operation and keep the vessel in safe water</p> <p>Vessel's heading is maintained within acceptable limits with respect to the requirements of the manoeuvre and the existing sea state</p> <p>Alterations of heading or power are smooth and controlled at all times</p> <p><i>Communication</i> is clear, concise and acknowledged at all times according to <i>good seamanship</i></p> <p>Suitable mode of steering is selected for the manoeuvre with respect to the area, wind and sea state</p> <p>Engine movements are made as needed to progress the operation and are designed to complement helm movements</p> <p>Safe operating limits of vessel propulsion, steering and power systems are not exceeded in normal manoeuvres</p> <p>Adequate <i>resources</i> are made available prior to and during operations.</p>
<p>Manoeuvre the vessel during <i>exceptional circumstances</i></p>	<p>Manoeuvres are made to safely progress the operation and keep the vessel in safe water in narrow confined channels, crossing bars, and entering existing seaways</p> <p>Vessel's heading is maintained within acceptable limits with respect to the requirements of the manoeuvre and the existing sea state</p> <p>Alterations of heading or power are smooth and controlled at all times</p> <p>Communication is clear, concise and acknowledged at all times according to <i>good seamanship</i></p> <p>Suitable mode of steering is selected for the manoeuvre with respect to the area, wind and sea state</p> <p>Engine movements are made as needed to progress the operation and are designed to complement helm movements</p> <p>Safe operating limits of vessel propulsion, steering and power systems are not exceeded</p>

Adequate resources are made available prior to and during operations.

Range of Variables

The Range of Variables places the competency in context and allows for differences between enterprises and workplaces, including practices, knowledge and requirements. The Range of Variables also provides a focus for assessment and relates to the unit as a whole. The following variables may be present.

Manoeuvres	<ul style="list-style-type: none"> • in areas of: bars and sea entrances confined navigational spaces narrow waters coastal waters open ocean while personally controlling navigation • such as: berthing and unberthing mooring and departing a single point mooring anchoring towing • in normal conditions.
Communication	<ul style="list-style-type: none"> • to internal personnel • to external agencies • verbal • by radio.
Good seamanship	<ul style="list-style-type: none"> • USL code • International Convention of Standards of Training, Certification and Watchkeeping (STCW) 1978 • sea state and tidal conditions • contingency planning.
Resources	<ul style="list-style-type: none"> • personnel • equipment • machinery • vessel manoeuvring equipment: single screw twin screw thrusters tug drives.

Exceptional circumstances

- loss of rudder
- loss of propeller
- in severe weather including storm and cyclonic conditions
- when hove to
- in the event of fire or flooding on own vessel
- ebb tide with onshore wind sea.

Evidence Guide

Each unit of competency has an Evidence Guide that relates directly to the Performance Criteria and the Range of Variables. Its purpose is to guide assessment of the unit in the workplace and/or training program. The following components provide information to assist this purpose.

Underpinning knowledge

The underpinning knowledge identified for this unit goes to more depth due to its likely inclusion in a group of units that may be used as the basis for the issue of licences by regulatory bodies.

The essential knowledge and understanding a person needs to perform work to the required standard includes:

- information relating to:
 - stopping distances and vessel manoeuvring characteristics and how they vary with displacement, trim and list
 - the absolute limits on vessel's manoeuvring capability and any restrictions on helm and engine movements
 - tidal times and heights
 - sea conditions including wind direction and currents
- procedures relating to:
 - emergency manoeuvres
 - manoeuvring with tugs
 - bridge team work monitoring methods
 - storm and cyclone contingency planning
- principles relating to:
 - transverse thrust
 - limitations of bow thrusters and other systems
 - effects of shallow water and narrow channels
 - nature of own vessel's turning circle and the factors affecting it
 - interaction between vessels
 - effects of current and tide.

Practical skills

The essential skills a person needs to perform work to the required standard include:

- berthing and unberthing using a fixed wharf
- mooring and leaving a single point mooring
- berthing, mooring and anchoring with and without a current
- anchoring with one or two anchors
- letting go and recovering anchors
- undertaking towing operations

Metal and Engineering Training Package

SFISHIP302A Take and Control Manoeuvres

- taking up and undertaking towing operations
- manoeuvring with:
 - single screw with or without controllable pitch
 - twin screw
 - tug drives
 - assistance of thrusters.
- correctly identifying wind and current direction.

Literacy skills used for:

- reading codes, standards and plans
- explaining manoeuvres

Numeracy skills used for:

- determining limits of manoeuvre
- reading nautical output.

Critical aspects of evidence

Assessment must confirm the ability to analyse the situation and select suitable manoeuvres, control manoeuvres, use resources effectively, and operate propulsion power.

Knowledge of:

- interaction of manoeuvres and conditions
- shallow water effects.

Interdependent assessment of units

This unit may be assessed after/with:

- nil.

Context of assessment

Assessment is to be conducted at the workplace or in a simulated workplace environment.

Method of assessment

The following assessment methods are suggested:

- written or oral short answer testing
- practical exercises
- project work
- observation of practical demonstration.

Resources required for assessment

Resources may include:

- a range of vessels with the various propulsion and control systems listed
- a range of berthing, mooring and anchoring facilities
- suitable site for tidal flow observation.

Key competencies

This refers to the seven areas of generic competency that underpin effective workplace practices. The Key Competencies cover the three levels of performance in the following areas:

Communicating ideas & information	Collecting, analysing & organising information	Planning & organising activities	Working with others and in teams	Using mathematical ideas and techniques	Solving problems	Using technology
Level 2	1	2	2	1	1	2

SFISHIP303A Initiate response to navigation emergencies

Functional area

Vessel operations

Prerequisite Unit/s: nil
Descriptor

This unit involves initiating action in the event of an emergency affecting one's own vessel or on identifying a distress signal from another vessel, while on watch.

Element of Competency	Performance Criteria
Respond to problems that affect vessel navigation	Type and magnitude of any problem is promptly identified Decisions and <i>actions</i> taken to address identified problems minimise adverse effects on vessel systems and navigational status <i>Reports and advice</i> are offered to the skipper according to standing orders.
Provide a navigational response to emergencies affecting the vessel	Initial actions are designed to maximise the safety of the vessel and personnel and are in accordance with contingency plans Manoeuvres taken to avoid the emergency or minimise damage are <i>effective</i> Lights, shapes and <i>signals</i> used are appropriate to the nature of the emergency and comply with the International Rules for Preventing Collisions at Sea Order of and methods used for informing vessel personnel is appropriate to the nature of the emergency Emergency radio communications comply with <i>regulations</i> Navigational control of the vessel is handed over according to regulations.
Respond to a distress signal at sea	Distress or emergency signals are immediately recognised Communications with the distress comply with international regulations and procedures

Information obtained about the position and nature of distress is the most comprehensive available

Reports of the distress made to personnel are complete and timely

Further actions comply with contingency planning and skipper's instructions.

Range of Variables

The Range of Variables places the competency in context and allows for differences between enterprises and workplaces, including practices, knowledge and requirements. The Range of Variables also provides a focus for assessment and relates to the unit as a whole. The following variables may be present.

Respond	<p>to malfunctions involving systems found on the bridge:</p> <ul style="list-style-type: none"> propulsion steering bridge equipment communication alarm <p>in areas or conditions of:</p> <ul style="list-style-type: none"> narrow waters coastal waters congested waters restricted visibility heavy weather and sea <p>to maximise the safety of:</p> <ul style="list-style-type: none"> own vessel other vessels personnel the environment.
Actions	<p>limited to responding to the situation by:</p> <ul style="list-style-type: none"> change over start up communications temporary repair seeking assistance proceeding at safe speed steering by sight
	<p>taken within the job holder's responsibility when in charge of a navigational watch:</p> <ul style="list-style-type: none"> identify communicate inform and seek advice establish distress position implement contingency plans.

Reports and advice	from the skipper from personnel responsible for maintaining and repairing equipment.
Effective	in terms of: magnitude timeliness
Signals	radio: distress urgency safety visual.
Regulations	International Convention for the Safety of Life at Sea (SOLAS) 1960, 1974 International Regulations for Preventing Collisions at Sea (COLREG) 1972 International Standards of Training, Certification and Watchkeeping for Seafarers (STCW) 1978 International Convention on Maritime Search and Rescue (SAR) 1979.

Evidence Guide

Each unit of competency has an Evidence Guide that relates directly to the Performance Criteria and the Range of Variables. Its purpose is to guide assessment of the unit in the workplace and/or training program. The following components provide information to assist this purpose.

Underpinning knowledge

The underpinning knowledge identified for this unit goes into more depth due its likely inclusion in a group of units that may be used as the basis for the issue of licenses by regulatory bodies.

The essential knowledge and understanding a person needs to perform work to the required standard includes:

- distress or emergency signals required by the International Regulations for Preventing Collisions at Sea (COLREG) 1972
- manoeuvring characteristics of the vessel without primary steering or main propulsion power
- vessel construction to a level sufficient to enable an appreciation of possible damage and watertight integrity
- limitations imposed on manoeuvring systems with respect to large, sudden manoeuvres
- how actions in general may affect the vessel, personnel and systems
- nature of information required from a vessel in distress
- specific types of distress, for example, stricken vessel, sunken submarine, downed aircraft
- procedures relating to:
 - actions to take in the event of malfunction or failure
 - changeover to backup systems where available
 - external and internal communications and warnings in an emergency
 - contingency plans for emergencies

Metal and Engineering Training Package

SFISHIP303A Initiate Response to Navigation Emergencies

initial actions to be taken on sighting or receiving a distress signal
type of response expected to distress, urgency and safety signals
search and rescue coordination
action taken upon sighting a wreck.

Practical skills

The essential skills a person needs to perform work to the required standard includes:

dealing with malfunction or failure of:

- main engine
- steering
- gyro or magnetic compass
- bridge controls

taking actions to:

- operate manoeuvring equipment
- use backup systems where available
- minimise damage to affected equipment
- use helm, engines or thruster units where available

dealing with:

- imminent collision
- collision
- stranding
- fire
- flooding
- person overboard
- dragging anchor
- systems failure affecting navigation
- steering by compass or sight
- cargo shift
- heavy seas
- sighting a wreck

using:

- helm and engines
- signaling apparatus
- systems for communicating internally and externally
- alarms
- remotely operated watertight doors
- other relevant equipment

dealing with a distress situation by:

- recognising different distress signals
- logging relevant information
- managing a watch after receipt of a distress signal.

Literacy skills used for:

- reading contingency plans
- reading standing orders
- reading the International Regulations for Preventing Collisions at Sea
- making log entries.

Metal and Engineering Training Package

SFISHIP303A Initiate Response to Navigation Emergencies

Numeracy skills used for:

reading bridge controls.

Critical aspects of evidence

Assessment must confirm the ability of a watch keeper to initiate effective action in the event of a range of emergencies affecting one's own vessel or on identifying a distress signal from another vessel.

Ability to:

recognise a malfunction

implement contingency plans

prioritise actions with respect to the nature of the problem and existing circumstances

inform the skipper when necessary

manoeuvre the vessel to advantage in an emergency

comply with signalling requirements of the International Regulations for Preventing Collisions at Sea

comply with emergency communications procedures

recognise a distress signal

obtain information on the distress

initiate positive action.

Knowledge of:

distress signals and relevant international conventions

manoeuvring characteristics of the vessel in various circumstances.

Interdependent assessment of units

This unit may be assessed after/with:

nil.

Context of assessment

Assessment is to be conducted at the workplace or in a simulated workplace environment.

Method of assessment

The following assessment methods are suggested:

written or oral short answer testing

practical exercises

project work

observation of practical demonstration

role playing.

Resources required for assessment

Resources may include:

damage control simulations

emergency response simulations

vessel simulator

signals and signalling devices.

Key competencies

Metal and Engineering Training Package

SFISHIP303A Initiate Response to Navigation Emergencies

This refers to the seven areas of generic competency that underpin effective workplace practices. The Key Competencies cover the three levels of performance in the following areas:

Communicating ideas & information	Collecting, analysing & organising information	Planning & organising activities	Working with others and in teams	Using mathematical ideas and techniques	Solving problems	Using technology
Level 2	2	2	2	1	2	1

SFISHIP304A • Manage the operation of auxiliaries and service plant outside normal parameters

Functional area

Vessel operations

Prerequisite Unit/s: nil
Descriptor

This unit involves managing the operation of auxiliary and service plant outside of normal operating parameters and methods when required by the needs of overall vessel safety or safe operation during malfunction.

Element of Competency	Performance Criteria
16. 1.	<p>16.66 1.1 <i>Operations</i> are planned and carried out in accordance with established <i>safety rules and regulations</i></p> <p>16.67 1.2 Need for alterations to routine operations are fully identified and justifiable</p> <p>16.68 1.3 Timing and degree of preparation of <i>plant</i> is appropriate to the actual condition of plant and the nature of any malfunction</p> <p>16.69 1.4 Planned alterations to <i>parameters</i> and methods are confirmed with all affected personnel</p> <p>16.70 1.5 Revised alterations to parameters and methods minimise the risk of plant damage and disruption to operations</p> <p>16.71 1.6 Revised parameters and methods are clearly and accurately <i>communicated</i> to all relevant operational personnel and subordinates</p> <p>16.72 1.7 Sequence and timings of start up or shut down of equipment and systems is determined by the actual condition of plant and the nature of any malfunction</p> <p>16.73 1.8 Abnormal operation of plant is minimised, commensurate with overall vessel safety.</p>

<p>17. 2.</p>	<p>17.74 2.1 Operations are planned and carried out in accordance with established safety rules and regulations</p> <p>17.75 2.2 Need for alterations to routine operations are fully identified and justifiable</p> <p>17.76 2.3 Revised alterations to parameters and methods minimise the risk of plant damage and disruption to operations</p> <p>17.77 2.4 Output is maintained as close to actual demand as the nature of any fault or condition permits</p> <p>17.78 2.5 Necessary alterations to output are made in good time and agreed with affected personnel</p> <p>17.79 2.6 Revised parameters and methods are clearly and accurately communicated to all relevant operational personnel and subordinates</p> <p>17.80 2.7 Abnormal operation of plant is minimised, commensurate with overall vessel safety.</p>
<p>18. 3.</p>	<p>18.81 3.1 Operations are planned and carried out according to established safety rules and regulations</p> <p>18.82 3.2 Need for alterations to routine operations are fully identified and justifiable</p> <p>18.83 3.3 New demand requirements are identified in sufficient time for safe operation</p> <p>18.84 3.4 Preparations for alterations in output comply with <i>good engineering practices and principles</i></p> <p>18.85 3.5 Timing and sequence of adjustments during alteration of output consistently meet the requirements of the operation</p> <p>18.86 3.6 Revised output matches demand as closely as the nature of any faults or conditions allows</p> <p>18.87 3.7 Abnormal operation of plant is minimised, commensurate with overall vessel safety.</p>

Range of Variables

The Range of Variables places the competency in context and allows for differences between enterprises and workplaces, including practices, knowledge and requirements. The Range of Variables also provides a focus for assessment and relates to the unit as a whole. The following variables may be present.

Operations	<ul style="list-style-type: none"> • start up and shut down of plant • on request for assistance • necessary for malfunctioning plant, for example for safety of navigation • necessary for operating outside normal parameters • alterations in output of more than 10% • manual adjustment of controls to achieve new demand • monitoring of remote operation.
Safety rules and regulations	<ul style="list-style-type: none"> • codes of safe working practice • enterprise safety regulations • occupational health and safety standards.
Plant	<ul style="list-style-type: none"> • includes: electrical systems auxiliary systems.
Parameters	<ul style="list-style-type: none"> • to include: pressure level flow temperature speeds voltage electrical power electrical frequency.
Communicated	<ul style="list-style-type: none"> • by the following methods: verbally in writing.
Good engineering practices and principles	<ul style="list-style-type: none"> • communicating with those affected by changes • considering all occupational health and safety issues • making and implementing contingency plans • calculating, estimating and testing of safe working loads for new work • considering the effect of changes on other systems.

Evidence Guide

Each unit of competency has an Evidence Guide that relates directly to the Performance Criteria and the Range of Variables. Its purpose is to guide assessment of the unit in the workplace and/or training program. The following components provide information to assist this purpose.

Underpinning knowledge

The underpinning knowledge identified for this unit goes into more depth due its likely inclusion in a group of units that may be used as the basis for the issue of licenses by regulatory bodies.

The essential knowledge and understanding a person needs to perform work to the required standard includes:

- plant operating instructions
- operating parameter values
- possible problems and faults that could occur
- different types and variations of systems likely to be encountered in the different types of marine system
- regulations affecting operations, for example safety, statutory and organisational
- alarm and emergency shut down parameter values
- methods of operation of control systems
- procedures relating to:
 - sequence and timing of operations and alterations to operations
 - emergency shut down and emergencies
 - isolation procedures and likely hazards
 - likely problems that could occur and how to deal with them
 - reporting inability to start up or shut down
- principles relating to:
 - operation of marine plant and other related systems
 - engineering sufficient to recognise operational limitations when operating outside normal parameters and to be able to redefine them
 - running plant outside normal parameters
 - engineering for the safe operation of plant, such as safe working loads, torques, vectors.

Practical skills

The essential skills a person needs to perform work to the required standard include:

- diagnosing faults, repairing, modifying and planning the maintenance of electrical systems:
 - electrical generation control systems
 - integration of multiple generation units
 - electrical distribution and control systems
- diagnosing faults, repairing, modifying and planning the maintenance of auxiliary services:
 - steering gear and equipment
 - domestic systems
 - compressed air systems
 - bilge pumping systems
 - refrigeration and air conditioning systems
 - hydraulic systems
- controlling operations such as:
 - start up from hot, warm and cold conditions
 - start up to full operating condition

Metal and Engineering Training Package

SFISHIP304A Manage the Operation of Auxiliaries and Service Plant Outside Normal Parameters

- start up to stand by condition
- emergency and partial emergency shut down
- shut down of malfunctioning equipment
- controlling modes of operation such as:
 - monitoring remote operation
 - setting restrictions on remote operation
 - local manual operation
 - emergency modes of operation
- making adjustments:
 - single
 - multiple.

Literacy skills used for:

- reading manufacturer's instructions.

Numeracy skills used for:

- monitoring
 - pressure
 - flows
 - temperatures
 - levels
 - speeds
 - vibrations
 - expansion
 - emissions
 - abnormalities.

Critical aspects of evidence

Assessment must confirm the ability to manage the operation of auxiliary and service plant outside of normal operating parameters and methods when required by the needs of overall vessel safety or safe operation during malfunction.

Ability to:

- identify a need for change in parameters and methods
- implement operations
- revise operating parameters and methods
- agree actions and communications
- identify changes in requirements
- alter output
- diagnose defective systems and plant
- devise remedies that maximise the output of systems and plant.

Knowledge of:

safe operation of all auxiliaries and service plant on the vessel.

Interdependent assessment of units

This unit may be assessed with:

Metal and Engineering Training Package

SFISHIP304A Manage the Operation of Auxiliaries and Service Plant Outside Normal Parameters

- SFISHIP305A Manage the operation of low powered marine diesel engines outside normal parameters.

Context of assessment

Assessment is to be conducted at the workplace or in a simulated workplace environment.

Method of assessment

The following assessment methods are suggested:

- written or oral short answer testing
- practical exercises
- project work
- observation of practical demonstration.

Resources required for assessment

Resources may include:

- fully operational surveyed vessel with the range of equipment described
- realistic simulations of engineering systems.

Key competencies

This refers to the seven areas of generic competency that underpin effective workplace practices. The Key Competencies cover the three levels of performance in the following areas:

Communicating ideas & information	Collecting, analysing & organising information	Planning & organising activities	Working with others and in teams	Using mathematical ideas and techniques	Solving problems	Using technology
Level 2	3	3	2	3	3	3

SFISHIP305A • Manage the operation of low powered marine diesel engines outside normal parameters

Functional area

Vessel operations

Prerequisite Unit/s: nil
Descriptor

This unit involves managing the necessary operation of marine diesel propulsion plant and associated systems outside of normal parameters and methods when required by the needs of overall vessel safety or safe operation during malfunction.

Element of Competency	Performance Criteria
19. 1.	<p>19.88 1.1 <i>Operations</i> are planned and carried out according to established <i>safety rules and regulations</i></p> <p>19.89 1.2 Need for alterations to routine operations are fully identified and justifiable</p> <p>19.90 1.3 Timing and degree of preparation of <i>plant</i> is appropriate to the actual condition of plant and the nature of any malfunction</p> <p>19.91 1.4 Planned alterations to <i>parameters</i> and methods are confirmed with all affected personnel</p> <p>19.92 1.5 Revised alterations to parameters and methods minimise the risk of plant damage and disruption to operations</p> <p>19.93 1.6 Revised parameters and methods are clearly and accurately <i>communicated</i> to all relevant operational personnel and subordinates</p> <p>19.94 1.7 Sequence and timings of start up or shut down of equipment and systems is determined by the actual condition of plant and the nature of any malfunction</p> <p>19.95 1.8 Abnormal operation of plant is minimised, commensurate with overall vessel safety.</p>

Metal and Engineering Training Package

SFISHIP305A Manage the Operation of Low Powered Marine Diesel Engines Outside Normal Parameters

20. 2.	20.96	2.1	Operations are planned and carried out according to established safety rules and regulations
	20.97	2.2	Need for alterations to routine operations are fully identified and justifiable
21.	21.98	2.3	Revised alterations to parameters and methods minimise the risk of plant damage and disruption to operations
	21.99	2.4	Output is maintained as close to actual demand as the nature of any fault or condition permits
	21.100	2.5	Necessary alterations to output are made in good time and agreed with affected personnel
	21.101	2.6	Revised parameters and methods are clearly and accurately communicated to all relevant operational personnel and subordinates
	21.102	2.7	Abnormal operation of plant is minimised, commensurate with overall vessel safety.
22. 3.	22.103	3.1	Operations are planned and carried out according to established safety rules and regulations
	22.104	3.2	Need for alterations to routine operations are fully identified and justifiable
	22.105	3.3	New demand requirements are identified in sufficient time for safe operation
	22.106	3.4	Preparations for alterations in output comply with <i>good engineering practices and principles</i>
	22.107	3.5	Timing and sequence of adjustments during alteration of output consistently meet the requirements of the operation.
	22.108	3.6	Revised output matches demand as closely as the nature of any faults or conditions allows
	22.109	3.7	Abnormal operation of plant is minimised, commensurate with overall vessel safety.

Range of Variables

The Range of Variables places the competency in context and allows for differences between enterprises and workplaces, including practices, knowledge and requirements. The Range of Variables also provides a focus for assessment and relates to the unit as a whole. The following variables may be present.

Operations	<ul style="list-style-type: none"> • start up and shut down of plant • on request for assistance • necessary for malfunctioning plant, for example, for safety of navigation • necessary for outside normal parameters and methods • alterations in output of more than 10% • manual adjustment of controls to achieve new demand • monitoring of remote operation.
Safety rules and regulations	<ul style="list-style-type: none"> • codes of safe working practice • enterprise safety regulations • occupational health and safety standards.
Plant	<ul style="list-style-type: none"> • includes: high or medium speed diesel engines gearbox and shafting auxiliaries systems necessary to move the vessel.
Parameters	<ul style="list-style-type: none"> • to include: pressure level flow temperature speeds.
Communicated	<ul style="list-style-type: none"> • by the following methods: verbally in writing.
Good engineering practice and principles	<ul style="list-style-type: none"> • communicating with those affected by changes • considering all occupational health and safety issues • making and implementing contingency plans • calculating, estimating and testing of safe working loads for new work • considering the effect of changes on other systems.

Evidence Guide

Each unit of competency has an Evidence Guide that relates directly to the Performance Criteria and the Range of Variables. Its purpose is to guide assessment of the unit in the workplace and/or training program. The following components provide information to assist this purpose.

Underpinning knowledge

The underpinning knowledge identified for this unit goes into more depth due its likely inclusion in a group of units that may be used as the basis for the issue of licences by regulatory bodies.

The essential knowledge and understanding a person needs to perform work to the required standard includes:

- plant operating instructions
- operating parameter values
- possible problems and faults that could occur
- the different types and variations of systems likely to be encountered as marine plant
- regulations affecting operations for example safety, statutory and organisational
- alarm and emergency shut down parameter values
- methods of operation of control systems
- procedures relating to:
 - the sequence and timing of operations and alterations to operations
 - emergency shut down and emergencies
 - isolation procedures and likely hazards
 - likely problems that could occur and how to deal with them
 - reporting inability to start up or shut down
- principles relating to:
 - the operation of marine plant and other related systems
 - engineering science sufficient to recognise operational limitations when operating outside normal parameters and to be able to redefine them
 - running plant outside normal parameters
 - relevant engineering science relating to the safe operation of plant.

Practical skills

The essential skills a person needs to perform work to the required standard includes, within the context of the element:

- diagnosing faults, repairing, modifying and planning the maintenance of prime mover, shafting and auxiliary systems:
 - high speed engines
 - medium speed diesel engines
 - slow speed diesel engines
 - fuel systems for diesel oil, marine diesel oil, blended fuel or heavy fuel including purification, transfer and storage
 - cooling and lubrication systems
 - shafts and propellers including controllable pitch propellers
- operations such as:
 - start up from hot, warm and cold conditions
 - start up to full operating condition
 - emergency and partial emergency shut down
 - shut down of malfunctioning equipment
- modes of operation such as:
 - monitoring remote operation
 - setting restrictions on remote operation

Metal and Engineering Training Package

SFISHIP305A Manage the Operation of Low Powered Marine Diesel Engines Outside Normal Parameters

local manual operation
emergency modes of operation

- adjustments:
single
multiple.

Literacy skills used for:

- reading operating procedures and manufacturer's guidelines
- recording results of changes made.

Numeracy skills used for:

- monitoring:
pressure
flows
temperatures
levels
speeds
vibrations
expansion
emissions
abnormalities

calculating:

fuel and lubrication capacity
fuel and lubrication consumption.

Critical aspects of evidence

Assessment must confirm the ability to manage the necessary operation of marine diesel propulsion plant and associated systems outside of normal parameters and methods when required by the needs of overall vessel safety or safe operation during malfunction.

Ability to:

- identify a need for change in parameters and methods
- implement operations
- revise operating parameters and methods
- agree actions and communications
- identify changes in requirements
- alter output
- diagnose defective systems and plant
- devise remedies that maximises the output of systems and plant.

Knowledge of:

- safe operation.

Interdependent assessment of units

This unit may be assessed with:

- SFISHIP304A Manage the operation of auxiliaries and service plant outside normal parameters.

Context of assessment

Assessment is to be conducted at the workplace or in a simulated workplace environment.

Method of assessment

The following assessment methods are suggested:

- written or oral short answer testing
- practical exercises
- project work
- observation of practical demonstration.

Resources required for assessment

Resources may include:

- fully operational surveyed vessel with the range of equipment described
- realistic simulations of engineering systems.

Metal and Engineering Training Package

SFISHIP305A Manage the Operation of Low Powered Marine Diesel Engines Outside Normal Parameters

Key competencies

This refers to the seven areas of generic competency that underpin effective workplace practices. The Key Competencies cover the three levels of performance in the following areas:

Communicating ideas & information	Collecting, analysing & organising information	Planning & organising activities	Working with others and in teams	Using mathematical ideas and techniques	Solving problems	Using technology
Level 2	3	3	2	3	3	3

SFISHIP306A • Monitor and control navigation in an inshore area

Functional area

Vessel operations

Prerequisite Unit:
Descriptor

SFISHIP202A Contribute to safe navigation

This unit involves monitoring and controlling navigation underway and at anchor in inshore areas only.

Element of Competency	Performance Criteria
23. 1.	23.110 1.1 <i>Charts, publications and documents</i> are the most up to date versions available
	23.111 1.2 Charts, publications and documents used reflect regular and accurate correction
	23.112 1.3 Presentation and filing of navigational warnings conforms to an approved format
	23.113 1.4 Handling and storage of charts and publications promotes their access, utility and length of life
	23.114 1.5 Chart correction records are accurate and conform to an approved format
	23.115 1.6 Information that is new or updated is selected from <i>relevant sources</i> at appropriate intervals.
24. 2.	24.116 2.1 <i>Primary position fixing</i> method selected is the most appropriate to the existing circumstances and conditions
	24.117 2.2 Time interval between fixes is appropriate to the prevailing navigation conditions
	24.118 2.3 Position is accurately obtained within acceptable instrument or system errors
	24.119 2.4 Continuous monitoring is used in addition to historic fixes
	2.5 Performance checks and tests of navigation position fixing systems comply with manufacturer's recommendations and enterprise procedures

Metal and Engineering Training Package

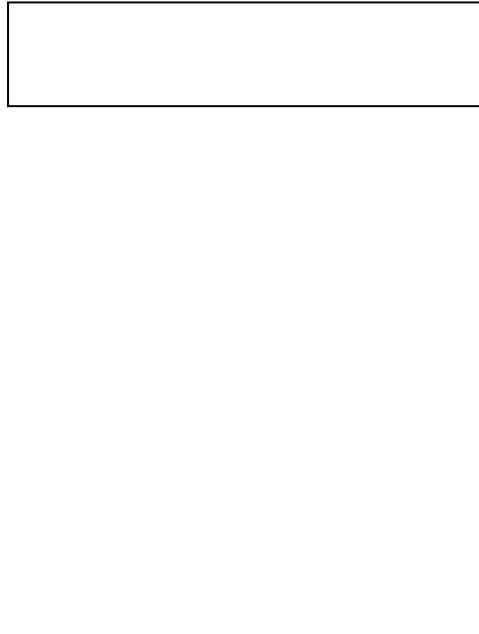
SFISHIP306A Monitor and Control Navigation in an Inshore Area

25.	25.120	2.6	Position of the vessel is recorded in a manner that complies with enterprise and <i>navigational rules and procedures</i>
	25.121	2.7	Verification of primary position fixing is frequent, regular and utilises the most appropriate method.
26. 3.	26.122	3.1	Decisions required for <i>amendments</i> to course or speed are timely, obvious and in accordance with accepted navigation practice
	26.123	3.2	Actions taken to alter the vessel's course or speed are timely and comply with the International Regulations for Preventing Collisions at Sea
	26.124	3.3	Vessel is navigated at a safe speed appropriate to the existing circumstances and conditions
	26.125	3.4	Adjustments made to the vessel's course and speed are effective and do not put the vessel at risk with respect to other traffic or hazards
	26.126	3.5	Adjustments made to the vessel's course and speed take account of overall passage plan requirements
	3.6		Signals relevant for manoeuvring required by the International Regulations for Preventing Collisions at Sea are made at the appropriate time
	3.7		Confirmation of the effectiveness of adjustments to course and speed is timely and utilises appropriate navigation techniques
	3.8		Operating limits of vessel propulsion, steering and power systems are not exceeded in normal manoeuvres.

Range of Variables

The Range of Variables places the competency in context and allows for differences between enterprises and workplaces, including practices, knowledge and requirements. The Range of Variables also provides a focus for assessment and relates to the unit as a whole. The following variables may be present.

Charts, publications and documents	<ul style="list-style-type: none"> • navigational charts • publications from the Australian Hydrographer or British Admiralty: <ul style="list-style-type: none"> radio signals light lists sailing directions tide tables catalogues • navigation warning records.
Relevant sources	<ul style="list-style-type: none"> • of information from: <ul style="list-style-type: none"> annual and weekly notices to mariners radio navigation warnings navigation warning files local navigation warnings.
Position fixing	<ul style="list-style-type: none"> • using methods of: <ul style="list-style-type: none"> visual RADAR continuous position monitoring.
Navigational rules and procedures	<ul style="list-style-type: none"> • collision • International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW), 1975 • USL code.
Amendments	<ul style="list-style-type: none"> • routines to be maintained when in charge of the bridge watch: <ul style="list-style-type: none"> during the day at night in narrow waters in coastal waters in severe weather conditions in poor visibility when under pilotage or at anchor



- of course or speed to:
 - avoid collision
 - correct for actual deviation from track
 - correct for anticipated deviation
 - correct for compass errors
 - avoid severe weather
- such as:
- stopping
 - going astern
 - manoeuvring in the vicinity of pilot vessels and other craft
 - picking up a pilot and regulatory personnel
 - turning short around
 - bringing the vessel up to a single anchor in an emergency
 - crew overboard.

Evidence Guide

Each unit of competency has an Evidence Guide that relates directly to the Performance Criteria and the Range of Variables. Its purpose is to guide assessment of the unit in the workplace and/or training program. The following components provide information to assist this purpose.

Underpinning knowledge

The underpinning knowledge identified for this unit goes into more depth due its likely inclusion in a group of units that may be used as the basis for the issue of licenses by regulatory bodies.

The essential knowledge and understanding a person needs to perform work to the required standard includes:

- principles relating to:
 - passage planning
 - RADAR and automated plotting sufficient to understand their limitations and safe use
 - operation of RADAR equipment
 - ship stability with respect to angles of heel, lists, rolling and pitching
 - cause and effects of gyro and magnetic compass error
 - meteorology in sufficient depth to interpret weather forecasts, forecast weather for the watch by reference to physical observation, and identify imminent changes in weather
 - meteorology in sufficient depth to forecast wind speed and direction to estimate the sea state resulting from weather, fetch, swell and current
 - gyro compass
 - magnetic compasses
 - operation of Doppler and electromagnetic logs
 - echo sounding equipment
 - causes of tides and currents
 - effects of shallow water and narrow channels
 - manoeuvring characteristics of the vessel and the factors affecting it
 - interaction between vessels
 - transverse thrust
 - limitations of bow thrusters

- tugs
- other manoeuvring systems where performance evidence is sought
- procedures relating to:
 - ordering procedures for charts and publications and any system designed to automatically order new editions and replacements
 - cross checking information contained in notices to mariners to ensure the validity of charts and publications
 - occasions when convention is to seek assistance
 - information necessary to hand over a bridge watch
 - government and enterprise requirements for performance checking and recording
 - selection of primary and secondary position fixing methods from those available
 - frequency of position fixing
 - methods and use of the various position fixing systems
 - assessing the risk of collision by visual, RADAR and automatic plotting
 - use of helm and engines
 - assessing leeway
 - assessing set and drift
 - maintaining a proper lookout
 - communicating with bridge and engine room personnel
 - emergency manoeuvres
 - obtaining general meteorological information
 - obtaining information specific to the nature of a cyclone as it affects the operation
- symbols and abbreviations contained in charts and publications
- content of all navigational charts and publications available to the mariners contained in the chart catalogue
- chart folio system
- International Regulations for Preventing Collisions at Sea
- bridge procedures guides
- enterprise guidelines
- International Maritime Organisation (IMO) operational guidance for officers in charge of a navigational watch.
- further references to keeping a safe navigational watch contained in marine notices
- different types of anchor and their advantages
- bridge equipment and the possible types of faults and how they could affect safe navigation
- forces affecting the vessel in a seaway and how it is constructed to counter them
- buoyage systems
- fixed and variable errors on navigational systems including RADAR
 - operational control and adjustment of navigation systems including RADAR
 - expected reliability of fixes from the various navigation systems
 - steering and sailing rules contained in the International Regulations for Preventing Collisions at Sea (COLREG)
 - specific local regulations where applicable
 - effect of tides and currents on vessel track
 - a particular vessel's manoeuvring characteristics
 - practical limitations of the vessel's manoeuvring equipment and propulsion systems
 - information available on charts especially latitude, longitude, depth, distance and direction
 - effect of wind direction and speed and sea state

effect of cyclones on operations.

Practical skills

The essential skills a person needs to perform work to the required standard include:

- laying off coastal passage plan
- monitoring:
 - traffic by radar, visual and aural methods
 - weather
 - the safety of the vessel and personnel
 - bridge equipment and instrumentation including performance checks, tests and identification of errors
 - position
- meteorology sufficient to forecast wind direction and speed and sea state
- obtaining information and assistance from:
 - colleagues
 - heads of department
 - skipper
- use RADAR to obtain optimal tuning for:
 - ranges
 - bearings
 - combinations
 - traffic targets
- use satellite navigation systems
- use continuous position monitoring:
 - parallel indexing techniques
 - observation of buoyage
 - use of echo sounding equipment
 - dead reckoning
- identifying anchorages:
 - in open waters
 - in restricted waters
- identifying causes of deviations from track:
 - wind
 - current
 - tide
 - sea state
- assessing:
 - risk of collision by visual means, RADAR and automatic plotting
 - magnitude and direction of leeway
 - set, rate and drift of current
 - position of a cyclone in order to make a decision on course of action including location of positions to seek shelter
- altering course and speed to:
 - return the vessel to a planned track when deviated
 - maintain a desired course made good
 - avoid a risk of collision when obliged to give way or stand on
- performing standard manoeuvres:
 - stopping
 - going astern

Metal and Engineering Training Package

SFISHIP306A Monitor and Control Navigation in an Inshore Area

- manoeuvring in the vicinity of pilot vessels and other craft
- picking up a pilot
- turning short around
- performing emergency manoeuvres:
 - bringing the vessel to a single anchor in an emergency
 - crew overboard
 - manoeuvres to minimise danger in the event of an imminent collision
 - turning in heavy weather
- using various vessel configurations:
 - fixed and controllable pitch propellers
 - single and twin screw
 - thrusters
 - nozzles
 - hull shape and factors.

Literacy skills used for:

- recording information:
 - on charts
 - in enterprise records
 - for supply to other personnel
 - to include notes on abnormalities or difficulties in operation
- reading information from:
 - charts
 - radio navigation warnings
 - lists of radio signals
 - light lists
 - sailing directions
 - catalogues.

Numeracy skills used for:

- reading:
 - tide tables
 - calculating time, speed and distance parameters.

Critical aspects of evidence

Assessment must confirm the ability to monitor and control the vessel in an inshore area by performing navigational tasks such as position fixing and course alterations.

Ability to:

- correct, update and replace charts and publications
- handle and store charts and publications
- maintain files of navigation warnings, if applicable
- ensure light and sound signals agree with existing circumstances and conditions
- ensure a proper lookout is maintained
- test and check bridge equipment
- identify hazards
- call the skipper
- comply with accepted navigational methodology and the skipper's requirements for

position fixing

- obtain, correct and plot position lines and positions on navigational charts
- comply with requirements and recommendations for the testing of position fixing systems for reliability
- make an assessment of a range of situations
- comply with the International Regulations for Preventing Collisions at Sea (COLREG)
- act effectively
- safely operate a vessel's manoeuvring system
- safely and effectively execute a range of manoeuvres
- control manoeuvres
- select steering systems.

Knowledge of:

- checking information or status and seeking assistance where necessary.

Interdependent assessment of units

This unit may be assessed after:

- SFISHIP202A Contribute to safe navigation.

Context of assessment

Assessment is to be conducted at the workplace or in a simulated workplace environment.

Method of assessment

The following assessment methods are suggested:

- written or oral short answer testing
- practical exercises
- project work
- observation of practical demonstration.

Resources required for assessment

Resources may include:

- fully operational vessel with a range of buoyage, traffic and navigational conditions
- suitable simulations of the same.

Key competencies

This refers to the seven areas of generic competency that underpin effective workplace practices. The Key Competencies cover the three levels of performance in the following areas:

Communicating ideas & information	Collecting, analysing & organising information	Planning & organising activities	Working with others and in teams	Using mathematical ideas and techniques	Solving problems	Using technology
Level 2	2	2	2	3	2	3

SFISHIP307A Plan maintenance for marine engineering systems

Functional area

Vessel operations

Prerequisite Unit/s: **nil**
Descriptor

This unit involves defining maintenance requirements and the short term planning and resourcing of maintenance for marine engineering and ancillary systems and equipment.

Element of Competency	Performance Criteria
Define <i>maintenance requirements for marine engineering and ancillary systems</i>	<p>Data on the factors affecting current or potential engineering maintenance is obtained from appropriate sources</p> <p>Interpretation and format of collated information is appropriate to determining maintenance requirements</p> <p><i>Information</i> on forecast condition is accurate with respect to known rates of deterioration</p> <p>Levels of priority and timing of maintenance requirements are accurately identified with respect to overall vessel safety, commercial operations and enterprise considerations</p> <p>Maintenance requirements are achievable and relevant to the needs and demands of safe and efficient plant operation.</p>
Plan the short term implementation of marine engineering and ancillary maintenance	<p>Maintenance <i>plans</i> project maintenance evenly over available time scale</p> <p>Maintenance plans are within the constraints of time, personnel and resources available</p> <p>Maintenance plans coordinate maintenance to minimise interdepartmental conflict</p> <p>Work methods and activities that are consistent with current operation priorities, enterprise objectives and government requirements and include opportunities for individual development</p> <p>Work methods and activities optimise the use of available material, capital and people and plans are made in close consultation with other departments</p> <p>Work methods and activities are specified to ensure maintenance objectives are achieved</p> <p>Plans are recorded in a suitable format for reference and comply with statutory and enterprise requirements.</p>
Organise resources for maintenance of marine engineering and ancillary systems	<p><i>Resource</i> requirements accurately match the projected demand obtained from maintenance plans and schedules</p> <p>Estimates of resource needs are supported by appropriate calculations</p> <p>Selection of resources is based on consideration of all relevant</p>

aspects of supply

Alternatives to first choice resources are acceptable within operating performance specification and enterprise, logistical and budgetary constraints

Refurbishments of replaced parts are correctly achieved within budgetary and re-use constraints.

Range of Variables

The Range of Variables places the competency in context and allows for differences between enterprises and workplaces, including practices, knowledge and requirements. The Range of Variables also provides a focus for assessment and relates to the unit as a whole. The following variables may be present.

Maintenance requirements

- with respect to:
 - long term maintenance programmes (one year and over)
 - short term implementation plans (one week to a month)
 - daily schedules including repair maintenance
 - production of specifications for maintenance in refit
 - data recording
 - routine maintenance and servicing
 - restoration and repair
 - protection from the environment.

Marine engineering and ancillary systems

- such as:
 - mechanical equipment and systems
 - electrical generation and transmission systems
 - control and instrumentation
 - safety equipment.

Information	<ul style="list-style-type: none">• regarding: maintenance intervals actual and desired condition routine servicing requirement restoration and repair requirements availability of resources safety requirements and precautions• sources compiled from: own experience and database classification society and statutory survey requirements manufacturers manuals and schedules actual condition forecast condition enterprise requirements, maintenance records, maintenance plans.
Plans	<ul style="list-style-type: none">• such as: short term implementation plans (one week to a month) daily schedules including repair maintenance• covering: resources methods and procedures safety precautions limits of responsibility quality requirements quantity requirements.
Resource	<ul style="list-style-type: none">• types include: personnel spares consumables.
Aspects of supply	<ul style="list-style-type: none">• to include: cost availability quantity quality standards.

Evidence Guide

Each unit of competency has an Evidence Guide that relates directly to the Performance Criteria and the Range of Variables. Its purpose is to guide assessment of the unit in the workplace and/or training program. The following components provide information to assist this purpose.

Underpinning knowledge

The underpinning knowledge identified for this unit goes into more depth due its likely inclusion in a group of units that may be used as the basis for the issue of licenses by regulatory bodies.

The essential knowledge and understanding a person needs to perform work to the required standard includes:

- maintenance objectives and plans
- enterprise policies and procedures regarding long term and day-to-day maintenance
- consequences of not carrying out maintenance
- marine engineering systems and their component parts
- specific hazards involved with machinery systems and maintenance resources
- maintenance objectives, priorities and plans
- company policies and procedures regarding productivity, quality and working conditions
- legislation relating to work methods and health and safety
- vessel and enterprise objectives, priorities and plans
- relevant company policies and procedures
- profitability, productivity and financial control
- vessel and company procedures for resource allocation
- principles relating to:
 - assessing and evaluating information in terms of relevance, reliability, sufficiency and implications
 - obtaining information on maintenance requirements
 - organisation information to assist planning
 - evaluating information
 - establishing, defining and reviewing objectives and performance measures, including project planning and resource allocation
 - using an analytical approach to assess and optimise the use of resources
 - applying relevant legislation to actual and proposed circumstances
 - selection of resources
 - identify alternative resources
 - organisational methods for supply of resources
 - organisational procedures for contractors and specialists
- all aspects of maintenance for which the officer is responsible
- the effects the marine environment has on the vessel specifically with respect to machinery maintenance
- the different types of material used in ship and machinery construction and their properties
- the requirements for statutory and classification surveys
- work objectives and related performance measures and success criteria
- principal risks and contingent factors affecting maintenance activities
- resources available for maintenance
- acceptable types of work methods
- permit to work systems
- availability of resources.

Practical skills

The essential skills a person needs to perform work to the required standard include:

- performing, organising and planning the maintenance required for:
 - long term maintenance programmes (one year and over)
 - short term implementation plans (one week to a month)

Metal and Engineering Training Package

SFISHIP307A Plan Maintenance for Marine Engineering Systems

- daily schedules including repair maintenance
- the production of specifications for maintenance in re-fit
- maintaining and planning the maintenance on marine engineering systems with respect to:
 - prime mover, shafting and associated auxiliaries
 - instrumentation and control systems
 - steering gear and equipment
 - domestic systems
 - deck machinery
 - fixed and portable fire fighting equipment
 - electrical generation equipment and distribution equipment
- developing work plans for:
 - routing greasing and oiling
 - inspections
 - replacement of components
 - work methods and procedures
 - safety precautions
 - break down repair
 - allocation of resources
 - preparation for statutory and class surveys
 - cleaning schedules
- organising resources such as:
 - spare gear
 - stores and consumables
 - personnel.

Literacy skills used for:

- using information regarding:
 - maintenance intervals
 - actual and desired condition
 - routine servicing requirement
 - restoration and repair requirements
 - availability of resources
 - safety requirements and precautions
- using information sources compiled from:
 - own experience
 - classification organisations and statutory survey requirements
 - manufacturers' manuals and schedules
 - actual condition
 - forecast condition
 - company requirements, maintenance records, maintenance plans.

Numeracy skills used for:

- estimating resource needs including:
 - voltage, wattage and current requirements
 - power point output capacity

Critical aspects of evidence

Metal and Engineering Training Package

SFISHIP307A Plan Maintenance for Marine Engineering Systems

Assessment must confirm the ability to define maintenance requirements and ensure short term planning and resourcing of maintenance to marine engineering and related systems and equipment.

Ability to:

- collect information necessary for planning
- identify maintenance requirements for the implementation of plans
- conduct the overall planning of maintenance
- identify suitable work methods
- record work and planning
- match resources with demand
- quantify and select resources and alternatives
- refurbish used resources.

Knowledge of:

- safe and effective work procedures.

Interdependent assessment of units

This unit may be assessed after/with:

- nil.

Context of assessment

Assessment is to be conducted at the workplace or in a simulated workplace environment.

Method of assessment

The following assessment methods are suggested.

- written or oral short answer testing
- practical exercises
- project work
- observation of practical demonstration.

Resources required for assessment

Resources may include:

- fully operational vessel with maintenance requirements.

Key competencies

This refers to the seven areas of generic competency that underpin effective workplace practices. The Key Competencies cover the three levels of performance in the following areas:

Communicating ideas & information	Collecting, analysing & organising information	Planning & organising activities	Working with others and in teams	Using mathematical ideas and techniques	Solving problems	Using technology
Level 2	2	3	3	1	1	1

SFISHIP401A • Ensure the seaworthiness of the vessel (simplified stability criteria)

Functional area

Vessel operations

Prerequisite Unit/s: nil
Descriptor

This unit involves ensuring that the watertight integrity and stability on a small vessel is maintained using simplified stability data.

Unit of Competency	Performance Criteria
27. 1.	<p>27.127 1.1 Work is planned and carried out in accordance with established <i>safety rules and regulations</i></p> <p>27.128 1.2 Coverage and frequency of checks and inspections on the vessel's seaworthiness complies with safety rules and regulations</p> <p>1.3 Degree of <i>vessel security</i> is commensurate with anticipated physical conditions and necessary <i>vessel operations</i></p> <p>1.4 Action taken in anticipation of environmental changes are timely and appropriate to the change</p> <p>1.5 Instructions to subordinates are clear, concise and made at an appropriate time and place</p> <p>1.6 Powered equipment is operated in accordance with manufacturer's instructions and codes of safe working practice</p> <p>1.7 <i>Action taken</i> in the event of irregularities is appropriate to their significance and designed to maximise watertight integrity</p> <p>1.8 Records on actions taken to ensure watertight integrity are complete, accurate and comply with statutory commercial and enterprise requirements.</p>
28. 2.	<p>28.129 2.1 Stability analysis and weight distribution planning are conducted at a time, frequency and scope appropriate to the proposed nature of the voyage or operation</p> <p>2.2 Weight distribution is designed to maintain the vessel within acceptable <i>stability</i> limits for all states of the voyage</p> <p>2.3 Trim, draughts and list are suitable to safely and efficiently progress all vessel operations</p>
29.	<p>2.4 Stability monitoring is conducted at a frequency and scope relevant to the nature, loaded state and speed of vessel operations, and is sufficient to ensure that stress and stability remain within acceptable limits at all times</p> <p>2.5 Action taken where weight distribution has or could exceed</p>

- | | |
|-----|---|
| | acceptable limits is prompt and designed to maximise ship safety |
| 2.6 | Spurious or false information from stability analysis is promptly recognised. |

Range of Variables

The Range of Variables places the competency in context and allows for differences between enterprises and workplaces, including practices, knowledge and requirements. The Range of Variables also provides a focus for assessment and relates to the unit as a whole. The following variables may be present.

Carried out	<ul style="list-style-type: none"> by self and subordinates in accordance with: <ul style="list-style-type: none"> statutory requirements commercial requirements operational requirements.
Safety rules and regulations	<ul style="list-style-type: none"> codes of practice: <ul style="list-style-type: none"> International Convention on Standards of Training, Certification and Watchkeeping for Fishing Vessel Personnel (STCW) 1995 USL Code codes of safe working practices company and organisation safety at work rules and regulations.
Vessel security	<ul style="list-style-type: none"> openings: <ul style="list-style-type: none"> vent hatches ducting lifting appliances and associated equipment stores and equipment large objects likely to be moved in a seaway other means of avoiding damage flooding and ensuring safe access security at cargo stowage assessment of possibility of cargo shift.
Vessel operations	<ul style="list-style-type: none"> operations involving loading, discharging and shifting of weights or fluids overall passage as consumables are used or replenished commercial operations.

Action taken	<ul style="list-style-type: none">• as a routine• prior to departure• on completion of operations or maintenance• in anticipation of change in environmental conditions.
Stability	<ul style="list-style-type: none">• transverse stability (static)• longitudinal stability (trim)• free surface effect.

Evidence Guide

Each unit of competency has an Evidence Guide that relates directly to the Performance Criteria and the Range of Variables. Its purpose is to guide assessment of the unit in the workplace and/or training program. The following components provide information to assist this purpose.

Underpinning knowledge

The underpinning knowledge identified for this unit goes into more depth due its likely inclusion in a group of units that may be used as the basis for the issue of licenses by regulatory bodies.

The essential knowledge and understanding a person needs to perform work to the required standard includes:

- function of all items concerning masses affecting seaworthiness including liquid stowage and baffle effect
- construction of vessels and information available on ship's plans
- possible effects of moving objects in heavy weather
- enterprise policies and procedures relating to ensuring seaworthiness
- possible effects of heavy weather on vessel's structure
- occupational health and safety regulations
- principles and methods of ensuring water tight integrity
- weather and weather systems sufficient to anticipate heavy weather
- possible damage that can be caused by severe motion affecting the vessel, including cargo shift
- effects of heavy weather on main plant and associated systems
- factors which may cause problems with ensuring watertight integrity and contingency measures to deal with them
- systems for monitoring effectiveness of watertight integrity
- hydrostatic stability data and maximum loading conditions
- various factors affecting the position of the center of gravity and the effects of its position on the stability of the vessel especially during loading operations
- factors affecting GZ curves
- dangers to vessels with large angles of heel and precautions to be taken when righting them
- relevant notices to mariners
- the effects of bilging or flooding and the principles of damage control
- specific effects on stability and stress caused by the type of vessel or the nature of the operation
- possible causes of cargo shift.

Practical skills

The essential skills a person needs to perform work to the required standard include:

- using power operated equipment such as cranes, derricks, winches, power-blocks and deck hatches within stability limits
- checking and inspecting vessel for seaworthiness
- securing gear using lashing, tomming, pound boards and patent securing arrangements
- loading, discharging and transferring stores, operational equipment, cargo, ballast fuel and consumables within stability limits.

Literacy skills used for:

- reading and interpreting:
 - codes of practices and regulations
 - manufacturer's instructions
 - weather data
 - keeping and maintaining records.

Numeracy skills used for:

- reading simplified stability data.

Critical aspects of evidence

Assessment must confirm the ability to ensure that the watertight integrity and stability of a small vessel is maintained using simplified stability data.

Ability to:

- comply with safety procedures
- check and inspect vessel for seaworthiness
- secure the vessel
- use power operated equipment
- anticipate and forecast change
- issue instructions
- deal with irregularities
- maintain records
- plan and analyse stability and stress for the proposed voyage
- ensure list, trim and stability is acceptable for vessel operations
- monitor vessel's stability by self and subordinates
- take remedial action to correct stability condition
- ensure stability analyses are reliable
- ensure adequate GM during lifting operations
- recognise causes and effects of free surface effect.

Knowledge of:

- the various factors effecting the position of the center of gravity and the effects of its position on the vessel including virtual rise of GM and free surface effect.

Metal and Engineering Training Package

SFISHIP401A Ensure the Seaworthiness of the Vessel (Simplified Stability Criteria)

Interdependent assessment of units

This unit may be assessed after/with:

- nil.

Context of assessment

Assessment is to be conducted at the workplace or in a simulated workplace environment.

Method of assessment

The following assessment methods are suggested:

- written or oral answers to questions
- practical exercises
- project work
- observation of practical demonstration.

Resources required for assessment

Resources may include:

- power operated equipment
- surveyed vessel
- appropriate weather data systems
- simulator.

Key competencies

This refers to the seven areas of generic competency that underpin effective workplace practices. The Key Competencies cover the three levels of performance in the following areas:

Communicating ideas & information	Collecting, analysing & organising information	Planning & organising activities	Working with others and in teams	Using mathematical ideas and techniques	Solving problems	Using technology
Level 2	3	2	1	2	1	2

SFISHIP403A • Monitor and control search and rescue operations

Functional area

Vessel operations

Prerequisite Unit/s: nil
Descriptor

This unit involves monitoring, controlling and undertaking search and rescue operations at sea. The action may be in response to instructions or requests received from an external agency.

Element of Competency	Performance Criteria
30. 1.	30.130 1.1 Distress and emergency signals are recognised immediately
	30.131 1.2 Communications relating to the distress comply with <i>international regulations and procedures</i>
	30.132 1.3 Identification derived on the position and nature of the distress is the most comprehensive information given
	30.133 1.4 Reports of the distress made to personnel are complete and at a time appropriate to the nature of the distress
	30.134 1.5 Further action complies with contingency planning and skipper's instructions.
31. 2.	31.135 2.1 <i>Level and nature of the assistance</i> provided is based on a realistic assessment of the practicability and ability of <i>own vessel</i> to help
	31.136 2.2 <i>Communications</i> are maintained in line with international regulations and procedures
	2.3 Plans for search and rescue procedures are designed to minimise risk to own vessel and crew and comply as close as possible with maritime search and rescue plans
	31.137 2.4 Organisation and command chain with other stations involved in the distress complies with maritime search and rescue plans
	31.138 2.5 Manoeuvres to implement search and rescue are taken promptly and with due regard to the existing circumstances and conditions
32.	2.6 Duration of search and rescue is appropriate to the level and nature of distress and the existing circumstances and conditions
	2.7 Records of the incident are complete and accurate and comply with statutory requirements.

Range of Variables

The Range of Variables places the competency in context and allows for differences between enterprises and workplaces, including practices, knowledge and requirements. The Range of Variables also provides a focus for assessment and relates to the unit as a whole. The following variables may be present.

Respond	<ul style="list-style-type: none"> • actions are taken within the limitations of the individual's responsibility when in charge of a navigational watch: <ul style="list-style-type: none"> identify communicate inform and seek advice establish distress position implement contingency plans • sources of distress signal or request for assistance include: <ul style="list-style-type: none"> ship at sea land based search and rescue coordination centre • in areas such as: <ul style="list-style-type: none"> narrow waters coastal waters ocean waters.
Signals	<ul style="list-style-type: none"> • radio: <ul style="list-style-type: none"> distress urgency safety • visual.
International regulations and procedures	<ul style="list-style-type: none"> • International Regulations for the Preventing Collisions at Sea (COLREG) 1972 • International Convention on Standards of Training, Certification and Watchkeeping (STCW), 1978 • USL code.

Level and nature of the assistance	<ul style="list-style-type: none">• record and relay distress• rendezvous with distress• implement search and rescue procedures: as only vessel involved as instructed.
Own vessel	<ul style="list-style-type: none">• only respondent to the distress• one of a number of respondents.
Communications	<ul style="list-style-type: none">• with the: distress other vessels search and rescue authorities aircraft.

Evidence Guide

Each unit of competency has an Evidence Guide that relates directly to the Performance Criteria and the Range of Variables. Its purpose is to guide assessment of the unit in the workplace and/or training program. The following components provide information to assist this purpose.

Underpinning knowledge

The underpinning knowledge identified for this unit goes into more depth due to its likely inclusion in a group of units that may be used as the basis for the issue of licences by regulatory bodies.

The essential knowledge and understanding a person needs to perform work to the required standard includes:

- distress and emergency signals
- nature of information required from a vessel in distress
- specific types of distress, for example, submarine sunk, aircraft down
- communications procedures in an emergency
- initial actions to be taken on sighting or receiving a distress signal
- procedures to be taken upon sighting a wreck, derelict or hazard to navigation
- type of response expected to distress, urgency and safety signals
- principles determining the length and duration of a search
- drift patterns of disabled vessels in relation to wind and current
- difficulties in sighting various types of vessel, aircraft and survival craft
- search and rescue procedures
- chain of command for search and rescue coordination
- procedures for taking survivors on board.

Metal and Engineering Training Package

SFISHIP403A Monitor and Control Search and Rescue Operations

Practical skills

The essential skills a person needs to perform work to the required standard include:

- recognising the distress signals listed in the current International Rules for Preventing Collisions at Sea
- fixing position of distress
- devising and charting a search plan.

Literacy skills used for:

- making log entries.

Numeracy skills used for:

- recording data.

Critical aspects of evidence

Assessment must confirm the ability to monitor and control search and rescue operations at sea.

Ability to:

- obtain and provide information on a distress
- initiate search and rescue action
- provide contingency plans
- manage a watch after receipt of a distress signal.

Knowledge of:

- distress signals.

Interdependent assessment of units

This unit may be assessed after/with:

- nil.

Context of assessment

Assessment is to be conducted at the workplace or in a simulated workplace environment.

Method of assessment

The following assessment methods are suggested:

- written or oral short answer testing
- practical exercises
- project work
- observation of practical demonstration.

Resources required for assessment

Resources may include:

- search and rescue scenarios
- real or simulated distress signals
- appropriate international regulations and procedures.

Key competencies

Metal and Engineering Training Package

SFISHIP403A Monitor and Control Search and Rescue Operations

This refers to the seven areas of generic competency that underpin effective workplace practices. The Key Competencies cover the three levels of performance in the following areas:

Communicating ideas & information	Collecting, analysing & organising information	Planning & organising activities	Working with others and in teams	Using mathematical ideas and techniques	Solving problems	Using technology
Level 2	2	2	3	1	2	1

SFISHIP501A Control overall safety of navigation operations

Functional area

Vessel operations

Prerequisite Unit/s:
Descriptor

nil

This unit involves directing navigational personnel and issuing guidelines and instructions.

Element of Competency	Performance Criteria
<p>Define navigational policy for the voyage</p>	<p><i>Instructions and orders</i> are clear, implicit and comply with enterprise procedures</p> <p>Instructions and orders are based on up to date and reliable <i>information</i> and relate to the specific requirements of the <i>voyage</i></p> <p>Limits of responsibility are clearly defined</p> <p>Planned contingency action complies with <i>good navigational practice</i> and relates to realistic scenarios</p> <p>Necessary instructions reflect the differing navigational experience of personnel and the specific requirements of the voyage</p> <p>Crew are selected and instructed on operational practices to meet compliance and enterprise requirements.</p>
<p>Provide navigation support when required</p>	<p><i>Assessment</i> of the situation is complete and made at an optimum time with respect to the existing circumstances</p> <p><i>Advice</i> offered is timely, effective and best suited to the existing circumstances</p> <p>Necessary immediate <i>action</i> is effective and reflects the urgency of the situation</p> <p>Times and occasions for taking control of navigation recognise the competence of subordinate personnel and the complexity of the situation</p> <p>Written instructions are complete and reflect good navigation practice, enterprise and government</p>

Action taken maximises the navigational safety of the vessel at all times and complies with good navigational practice.

Range of Variables

The Range of Variables places the competency in context and allows for differences between enterprises and workplaces, including practices, knowledge and requirements. The Range of Variables also provides a focus for assessment and relates to the unit as a whole. The following variables may be present.

Instructions and orders	include: navigation standing orders limitations and guidelines for passage planning contingency plans for navigational incidents.
Information	from: own experience other departments navigational personnel publications outside bodies, for example, weather routing services radio stations.
Voyage	inshore offshore Australian coastal and middle waters world wide.
Good navigational practice	International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW), 1978 International Regulations for Preventing Collisions at Sea (COLREG), 1972.
Assessment	on arrival on bridge at regular intervals.
Advice	given: verbally in writing.

Action	monitoring subordinates advising subordinates relieving subordinates taken: on request for specified situations during contingencies when considered necessary.
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Evidence Guide

Each unit of competency has an Evidence Guide that relates directly to the Performance Criteria and the Range of Variables. Its purpose is to guide assessment of the unit in the workplace and/or training program. The following components provide information to assist this purpose.

Underpinning knowledge

The underpinning knowledge identified for this unit goes into more depth due its likely inclusion in a group of units that may be used as the basis for the issue of licenses by regulatory bodies.

The essential knowledge and understanding a person needs to perform work to the required standard includes:

- vessel and company objectives, priorities, plans and delegation of responsibility with respect to safe navigation
- relevant company policies and procedures regarding navigational management
- navigational quality and working conditions
- application of legislation and international requirements
- operation of machinery and control systems
- vessel navigational objectives and plans
- operational procedures regarding navigation including approval of passage planning
- relevant navigational policies and procedures
- legislative requirements
- competence of watch keeping personnel
- operation of machinery and control systems
- principles and methods relating to:
 - establishing, defining and reviewing objectives and performance measures, including resource allocation
 - identifying competence requirements in relation to forecast navigational demands
 - forming and managing bridge teams
 - identifying, defining and assessing the competence of individual navigational personnel
 - defining and allocating responsibilities and authority
 - assessing and evaluating navigation information
 - seeking and exchanging navigational information and offering advice and support
 - assessing alternative courses of action
- processes and systems relating to the control of navigation
- the likely needs and concerns of watch keeping personnel for information and advice
- the courses of action that could be taken to deal with contingencies and the likely consequences of each
- available publications and sources of advice that may be referenced
- weather forecasting and weather routing
- navigation risks and contingent factors affecting voyage objectives

severe weather conditions
action to avoid collision in multiple vessel situations.

Practical skills

The essential skills a person needs to perform work to the required standard include:

producing standing orders and contingency plans for:

- calling the skipper
- conduct in restricted visibility
- requirements for lookouts
- use of steering systems
- use and correction of charts and publications
- use of navigational aids
- the watch complement in special circumstances
- the need for checking information in order to minimise the risk of ‘one person errors’
- radio communications
- plans for emergency situations
- explicit instructions for acting as watch keeper in sole charge of a watch
- acting as a watch keeper when skipper is in charge of navigation
- acting as a watch keeper with a pilot on board

producing passage planning guide lines addressing:

- type of sailing required
- route preferences and restrictions
- prohibited and hazardous areas

receiving and providing advice in situations when:

- restricted visibility is encountered or expected
- traffic conditions or other vessels are giving rise for concern
- difficulty is experienced in maintaining course
- land, navigation marks or soundings are not sighted or obtained by the expected time
- unexpected land or navigation marks are sighted or an unexpected change in sounding occurs
- heavy weather may result in damage or imperil the vessel
- meeting any hazard to navigation
- meeting any situation where the watch keeper is in doubt

receiving and providing advice during contingencies for:

- imminent collision or collision
- stranding
- fire
- flooding
- crew overboard
- dragging anchor
- systems failure effecting navigation, including main engine, steering, compass or bridge control.

Literacy skills used for:

providing written advice for:

- night orders
- specific instructions for areas of complex navigation
- relevant sections of navigation standing orders.

Metal and Engineering Training Package

SFISHIP501A Control Overall Safety of Navigation Operations

Numeracy skills used for:

using charts and other navigational aids.

Critical aspects of evidence

Assessment must confirm ability to direct navigational personnel and to issue guidelines and instructions.

Ability to:

develop the content of orders and instructions

define the limits of responsibility

develop contingency plans

amend and update navigational information

assess the situation

advise subordinates

implement immediate action

take control of navigation

write instructions

produce effective navigational procedures.

Knowledge of:

effective navigational policy, procedures and systems.

Interdependent assessment of units

This unit may be assessed with:

- SFISHIP503A Prepare and plan the voyage.

Context of assessment

Assessment is to be conducted at the workplace or in a simulated workplace environment.

Method of assessment

The following assessment methods are suggested:

- written or oral short answer testing
- practical exercises
- project work
- observation of practical demonstration.

Resources required for assessment

Resources may include:

- realistic scenarios for assessing the systems developed
- vessel simulator.

Key competencies

This refers to the seven areas of generic competency that underpin effective workplace practices. The Key Competencies cover the three levels of performance in the following areas:

Communicating ideas & information	Collecting, analysing & organising information	Planning & organising activities	Working with others and in teams	Using mathematical ideas and techniques	Solving problems	Using technology
Level 3	2	2	3	1	2	1

SFISHIP502A • Ensure the seaworthiness of the vessel

Functional area

Vessel operations

Prerequisite Unit/s:
Descriptor

nil

This unit involves ensuring the watertight integrity, stability and security of vessels operating inshore, offshore, in Australian coastal and middle waters and/or world-wide.

Element of Competency	Performance Criteria
33. 1.	<p>33.139 1.1 Work is planned and <i>carried out</i> in accordance with established <i>safety rules and regulations</i></p> <p>33.140 1.2 Coverage and frequency of checks and inspections on the vessel's seaworthiness complies with the established safety rules and regulations</p> <p>1.3 Degree of <i>vessel security</i> is commensurate with anticipated physical conditions and necessary <i>vessel operations</i></p> <p>1.4 Action taken in anticipation of <i>environmental changes</i> are timely and appropriate to the change</p> <p>1.5 Instructions to subordinates are clear, concise and made at an appropriate time and place</p> <p>1.6 Powered equipment is operated in accordance with manufacturer's instructions and codes of safe working practice</p> <p>1.7 <i>Action taken</i> in the event of <i>irregularities</i> is appropriate to their significance and designed to maximise watertight integrity</p> <p>1.8 Records on actions taken to ensure watertight integrity are complete, accurate and comply with statutory commercial and enterprise requirements.</p>
34. 2.	<p>34.141 2.1 Stability calculations and weight distribution planning is conducted at a time, frequency and scope appropriate to the proposed nature of the voyage or operation</p> <p>2.2 Weight distribution is designed to maintain the vessel within acceptable <i>stability and stress</i> limits for all states of the voyage</p>
35.	<p>2.3 Trim, draughts and list are suitable to safely and efficiently progress all vessel operations</p> <p>2.4 Stability and stress monitoring is conducted in time and scope relevant to the nature and speed of vessel operations, and sufficient enough to ensure that stress and stability remain</p>

- within acceptable limits at all times
- 2.5 Action taken where weight distribution is compromising ship safety, is prompt and designed to maximise safety
 - 2.6 Tests and checks that are performed on computer-based stability programs are conducted at a frequency and scope that conform to manufacturer's instructions
 - 2.7 Information from stress and stability calculations that is spurious or false is promptly recognised.

Range of Variables

The Range of Variables places the competency in context and allows for differences between enterprises and workplaces, including practices, knowledge and requirements. The Range of Variables also provides a focus for assessment and relates to the unit as a whole. The following variables may be present.

Carried out	<ul style="list-style-type: none"> • by self and subordinates in accordance with: <ul style="list-style-type: none"> statutory requirements commercial requirements operational requirements.
Safety rules and regulations	<ul style="list-style-type: none"> • codes of practice: <ul style="list-style-type: none"> International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW), 1978 USL Code • codes of safe working practices, including application and interpretation of information and calculations in vessel stability booklet • enterprise safety at work rules and procedures.
Vessel security	<ul style="list-style-type: none"> • openings • lifting appliances and associated equipment • stores and equipment • large objects likely to be moved in a seaway • other means of avoiding damage • flooding and ensuring safe access • at cargo stowage • assessment of possibility of cargo shift.
Vessel operations	<ul style="list-style-type: none"> • operations involving loading, discharging and shifting of weights • overall passage as consumables are used or replenished • commercial operations • periods of re-fit including dry-docking.

Environmental changes	<ul style="list-style-type: none">• weather• tides• current• visibility.
Action taken	<ul style="list-style-type: none">• as a routine• prior to departure• on completion of operations or maintenance• in anticipation of change in environmental conditions.
Irregularities	<ul style="list-style-type: none">• flooding• heavy weather damage• damage to watertight sealing arrangements.
Stability and stress	<ul style="list-style-type: none">• transverse stability, both dynamic and static• longitudinal stability• free surface effect• torsion• bending moments• shear forces• damage stability.

Evidence Guide

Each unit of competency has an Evidence Guide that relates directly to the Performance Criteria and the Range of Variables. Its purpose is to guide assessment of the unit in the workplace and/or training program. The following components provide information to assist this purpose.

Underpinning knowledge

The underpinning knowledge identified for this unit goes into more depth due its likely inclusion in a group of units that may be used as the basis for the issue of licenses by regulatory bodies.

The essential knowledge and understanding a person needs to perform work to the required standard includes:

- function of all aspects of loadline items for all areas affecting seaworthiness
- construction of vessels and the information available on ship's plans and stability parameters
- company policies and procedures relating to ensuring seaworthiness
- possible effects of heavy weather on ship's structure
- health and safety regulations
- principles of vessel stability
- principles and methods relating to ensuring watertight integrity
- weather and weather systems sufficient to anticipate heavy weather
- possible damage that can be caused by severe motion effecting the vessel
- the effects of heavy weather on the plant and associated systems
- factors which may cause problems with ensuring watertight integrity and contingency measures to deal with them
- systems for monitoring effectiveness of watertight integrity
- possible causes and effects of cargo shift.

Practical skills

The essential skills a person needs to perform work to the required standard include:

- using power operated equipment such as cranes, derricks, winches, power-blocks and deck hatches
- checking and inspecting vessel for seaworthiness
- securing the vessel using lashing, tomking, pound boards and patent securing arrangements
- issuing instructions.

Literacy skills used for:

- reading and interpreting:
 - codes of practices and regulations
 - manufacturer's instructions
 - weather data
- keeping and maintaining records.

Numeracy skills used for:

- reading and calculating hydrostatic stability and stress data.

Critical aspects of evidence

Metal and Engineering Training Package

SFISHIP502A Ensure the Seaworthiness of the Vessel

Assessment must confirm the ability to ensure that the watertight integrity and stability is maintained on vessels involved in unlimited operational areas.

Ability to:

- comply with safety procedures
- check and inspect vessel for seaworthiness
- secure the vessel
- use power operated equipment
- anticipate and forecast weather change
- issue instructions
- anticipate and deal with irregularities
- maintain records
- plan and calculate stability and stress parameters for the proposed voyage
- correctly list and trim to acceptable standards for vessel operations
- monitor vessel's stability by self and subordinates
- take remedial action to correct stability condition
- ensure stability calculations are reliable
- initiate and perform tests and checks on computer-based stability programs
- perform stability and stress calculations
- ensure adequate GM during lifting operations
- recognise causes and effects of free surface effect.

Knowledge of:

- occupational health and safety rules and regulations
- hydrostatic stability and stress data
- various factors effecting the position of the centre of gravity and the effects of its position on the vessel, including virtual rise of GM and free surface effect
- factors affecting GZ curves
- stability at moderate and large angles of heel
- dangers to vessels with large angle of heel and precautions to be taken when righting them
- relevant marine notices
- effects of bilging or flooding and the principles of damage control
- torsional stress when applied to ships
- methods for compensating for discontinuity of strength, local and special stiffening
- longitudinal stability
- specific effects on stability and stress caused by type of ship or nature of trade.

Interdependent assessment of units

This unit may be assessed after/with:

- SFISHIP401A Ensure the seaworthiness of the vessel (simplified stability criteria).

Context of assessment

Assessment is to be conducted at the workplace or in a simulated workplace environment.

Method of assessment

The following assessment methods are suggested:

- written or oral answers to questions
- practical exercises
- project work
- observation of practical demonstration.

Resources required for assessment

Resources may include:

- power operated equipment
- surveyed vessel
- appropriate weather data systems
- stability information
- computer-based stability program
- simulator.

Key competencies

This refers to the seven areas of generic competency that underpin effective workplace practices. The Key Competencies cover the three levels of performance in the following areas:

Communicating ideas & information	Collecting, analysing & organising information	Planning & organising activities	Working with others and in teams	Using mathematical ideas and techniques	Solving problems	Using technology
Level 2	3	2	1	3	1	3

SFISHIP503A . Prepare and plan the voyage

Functional area

Vessel operations

Prerequisite Unit/s:

SFISHIP306A Monitor and control navigation in an inshore area

Descriptor

This unit involves planning and recording a voyage (inshore, offshore, Australian coastal and middle waters and/or world-wide), including making amendments when on passage.

Element of Competency	Performance Criteria
Prepare a passage plan	<p>Charts and publications appropriate to the proposed <i>passage</i> are selected</p> <p>All relevant information required for an appraisal of the intended passage is obtained and collated</p> <p>Areas and safe havens in which it is possible to navigate and remain safely afloat are accurately identified</p> <p>Appropriate warnings and precautions are shown in the plan for specified areas of marine hazard</p> <p>Planned track is designed to clear hazards at as safe a distance as is practical and is within given guidelines and vessel limitations</p> <p>Courses and distances for the voyage are evaluated accurately</p> <p><i>Passage plan</i> is complete and fully documented</p> <p>Team members are briefed prior to voyage.</p>
Record and adjust the passage plan	<p>All relevant information is accurately plotted on the largest scale charts available</p> <p>Information is presented using accepted navigational notation</p> <p>Electronic navigational systems are correctly programmed and updated with passage plan information</p> <p>Records of key elements are in an approved format suitable for reference</p> <p>Approved alterations to the plan are accurately evaluated, plotted and recorded.</p>

Range of Variables

The Range of Variables places the competency in context and allows for differences between enterprises and workplaces, including practices, knowledge and requirements. The Range of Variables also provides a focus for assessment and relates to the unit as a whole. The following variables may be present.

Passage	<ul style="list-style-type: none">• from berth to berth• including: narrow waters coastal waters ocean areas.
Passage plan	<ul style="list-style-type: none">• to include evaluation and recording of: meteorological and oceanic conditions restricted visibility traffic courses and distances speeds course alteration points under keel clearance position fixing methods in high risk areas contingency plans• to be completely evaluated before commencement of voyage• to include 'on voyage' alterations made necessary during passage.

Evidence Guide

Each unit of competency has an Evidence Guide that relates directly to the Performance Criteria and the Range of Variables. Its purpose is to guide assessment of the unit in the workplace and/or training program. The following components provide information to assist this purpose.

Underpinning knowledge

The underpinning knowledge identified for this unit goes into more depth due its likely inclusion in a group of units that may be used as the basis for the issue of licenses by regulatory bodies.

The essential knowledge and understanding a person needs to perform work to the required standard includes:

- world-wide and local currents and tides
- use of sailing directions, routing charts and other routing publications
- range and characteristics of navigational marks
- availability and coverage of radio navigation systems
- world-wide and local climatological conditions
- vessel's manoeuvring characteristics
- principles relating to:
Mercator sailing
great circle sailing

Metal and Engineering Training Package

SFISHIP503A Prepare and Plan the Voyage

- composite sailing
- passage planning generally, including chart notations
- weather routing
- navigation in extremes of conditions
- tidal calculations
- features of Mercator and gnomonic charts
- continuous monitoring techniques using RADAR
- procedures relating to:
 - passage planning
 - plotting on navigational charts
 - evaluation of course and distance
 - rendezvousing with another vessel
 - operating electronic navigation equipment.

Practical skills

The essential skills a person needs to perform work to the required standard include:

- using courses and distances with Mercator and great circle sailing
- determining safe speeds, speed alterations required and the identification of areas where a change in engine status is required
- determining course alteration and wheel over positions
- determining minimum under keel clearance required in critical areas
- determining the height of tide required to:
 - pass over a point
 - pass under an obstruction
 - allow for squat and trim
- develop contingency plans for emergency situations in critical navigation areas
- determining position fixing methods:
 - identification of available methods
 - identification of points and areas where accuracy of position fixing is critical
 - recommended primary and secondary position fixing methods.

Literacy skills used for:

- reading sailing directions
- reading other sources of information
- making written instructions and annotations.

Numeracy skills used for:

- estimating time, speed and distance
- programming navigational systems.

Critical aspects of evidence

Assessment must confirm the ability to plan and record a voyage in inshore, offshore, Australian coastal and middle waters and/or world-wide, including amendments when on passage.

Ability to:

- prepare for the development of a passage plan
- 'outline plan' the route
- identify the intended route

Metal and Engineering Training Package

SFISHIP503A Prepare and Plan the Voyage

- evaluate and record key parts of the plan
- plot all relevant passage planning information on navigational charts using accepted notation
- program navigational systems to include way points on navigational systems and charts and clearing lines on RADAR systems
- record ancillary information for reference
- evaluate and record necessary alterations during passage
- highlighting zone hazards.

Knowledge of:

- resources available to assist passage planning.

Interdependent assessment of units

This unit may be assessed with:

- SFISHIP501A Control overall safety of navigation operations.

Context of assessment

Assessment is to be conducted at the workplace or in a simulated workplace environment.

Method of assessment

The following assessment methods are suggested:

- written or oral short answer testing
- practical exercises
- project work
- observation of practical demonstration.

Metal and Engineering Training Package

SFISHIP503A Prepare and Plan the Voyage

Resources required for assessment

Resources may include:

- sources of information required for passage planning
- appropriate charts covering intended routes
- navigation systems
- vessel simulator.

Key competencies

This refers to the seven areas of generic competency that underpin effective workplace practices. The Key Competencies cover the three levels of performance in the following areas:

Communicating ideas & information	Collecting, analysing & organising information	Planning & organising activities	Working with others and in teams	Using mathematical ideas and techniques	Solving problems	Using technology
Level 2	2	3	2	2	1	2

UNIT NAME	Provide emergency care
UNIT CODE	PUAEME001A
UNIT DESCRIPTOR	This unit covers the competency to provide emergency care pending the arrival of appropriately qualified personnel

ELEMENT	PERFORMANCE CRITERIA
1. Identify need for emergency care	<ol style="list-style-type: none"> 1. Initial assessment is made of extent and nature of emergency care required 2. Initial assessment is communicated to appropriate personnel in accordance with organisation's policies and procedures
2. Ensure personal safety of carer and casualty	<ol style="list-style-type: none"> 3. Hygiene is maintained for protection of self and casualty 4. Hazards to the carer are identified and appropriate action taken to safeguard against injury
3. Reassure casualty	<ol style="list-style-type: none"> 1. A calm, caring and reassuring manner is adopted in interaction with the casualty and others at the scene 2. Casualty is made comfortable using available resources
4. Assess casualty and implement emergency care procedures	<ol style="list-style-type: none"> 3. Casualty assessed for DRABC 4. Vital signs are continually monitored, recorded and any changes considered in planning treatment and reported as appropriate 5. Treatment appropriate to the casualty's injuries is provided in line with approved first aid techniques and standards 6. First aid equipment is operated in accordance with manufacturer's procedures and instructions, and organisational standards, policies. procedures and protocols 7. Casualty's condition is monitored and reported in accordance with organisation's policies and procedures and treatment modified as necessary 8. Treatment is maintained until qualified medical help takes over
5. Work cooperatively with personnel from other organisations	<ol style="list-style-type: none"> 9. Clear and comprehensive reports are provided to personnel involved in ongoing casualty care 10. Members of other emergency services are assisted in their tasks in accordance with organisation's standards and personal level of responsibility and competence
6. Recover and restore first aid equipment	<ol style="list-style-type: none"> 11. First aid equipment is recovered, cleaned, inspected/tested, stored, restocked and resupplied and medical waste disposed of safely according to organisation's policies and procedures 12. First aid equipment faults are rectified and/or reported in accordance with organisation's policies and procedures
7. Complete documentation	<ol style="list-style-type: none"> 13. Documentation is completed and processed in line with legislative, regulatory and organisation's requirements

RANGE OF VARIABLES

Conditions under which this competency may be required include	operating during any rescue or response situation including specialist rescue hazardous environmental conditions—adverse weather after dark operations difficult terrain debris traffic time pressures varying time frames—short term sudden impacts protracted response operations limited access to equipment necessitating the use of improvised techniques
Equipment may include	first aid kit personal protective equipment stretchers including improvised
Details of incident obtained from	casualty visual assessment of scene others at scene
Maintaining personal safety may include	washing hands using gloves
Caring manner may include	personal introduction and identification consistent with other priorities showing empathy communication with casualty voice tone and volume reassurance and gentle treatment all in a culturally appropriate manner
Hazards may include	bodily fluids traffic environmental hazards downed wires bystanders drugs sharps
First aid techniques and standards may include	Guidelines to Australian Resuscitation Council resuscitation standards State and Territory regulations
Others may include	family friends at scene
Appropriate action may include	protecting scene isolating scene relocating casualty

Reporting as appropriate may include	team leader supervisor medical personnel paramedical personnel emergency medical technician
Treatment includes	applying resuscitation techniques controlling bleeding managing fractures managing soft tissue injuries dressing burns and scalds
Qualified health care personnel may include	specialist personnel medical personnel
Organisation's standards, policies, procedures and protocols may include	legislation relevant to the provision of emergency care legislation relevant to the organisation operational Standard Operating Procedures operational performance standards
Reporting casualty's condition may include	need for confidentiality status on arrival treatment provided history observations made changes in conditions timeframes
Documentation may include	written reports casualty details approved forms verbal report personal notes
Moving casualty may include	individually or with assistance observing decency in regard to culture a range of manual handling techniques and lifts and carries
Processing documentation may include	providing reports to authorised personnel filing reports diary entries logs
EVIDENCE GUIDE	
Critical aspects of evidence	Competency in this unit must be established through the practical demonstration of first aid skills, maintaining universal precautions and safety awareness. Accurate documentation and a caring approach to injured persons during first aid activities are critical
Interdependent assessment of units	Pre-requisite units: PUAFIR201A Prevent injury (Fire Specific) Co-requisite units: Nil

Underpinning knowledge	Occupational health and safety guidelines for lifting and carrying systems of the body: respiratory, skeletal digestive circulatory nervous urinary skin causes and management of unconsciousness priorities for life support in emergencies including the DRABC (danger, response, airway, breathing ventilation and circulation assessments) model health department guidelines for personal hygiene Australian Resuscitation Council resuscitation guidelines applying resuscitation techniques controlling bleeding casualty assessment principles of initial casualty management management of fractures and soft tissue injuries management of burns personal level of responsibility limitations competency
Underpinning skills	remaining calm under time pressures and in difficult situations communicating verbally with casualties and others providing verbal reports to paramedical personnel completing forms writing reports following procedures working with others in a team situation
Resource implications	Access to first aid equipment used in general operations is essential
Consistency of performance	Evidence should be gathered over a period of time in a range of actual or simulated workplace environments
Context of assessment	Exercise or simulation, or a series of tasks are required to demonstrate competence in this unit. This may involve setting scenarios to be completed either individually or as a member of a team. Written or verbal questions may be used as supporting evidence

KEY COMPETENCY

Collect analyse and organise information	Communicate ideas and information	Plan and organise activities	Work with others and in teams	Use mathematical ideas and techniques	Solve problems	Use technology
1	1	1	1	1	1	1

UNIT NAME	Manage injuries at emergency incident
UNIT CODE	PUAEME002B
UNIT DESCRIPTOR	This unit covers competency in more advanced emergency care and may include the use of equipment

ELEMENT	PERFORMANCE CRITERIA
1. Assess of scene	<ul style="list-style-type: none"> 1. Initial assessment is made of extent and nature of emergency care required 2. Hazards to self and others are identified and appropriate action taken to safeguard against injury 3. Identify and communicate additional or specific resource requirements
2. Assess casualty	<ul style="list-style-type: none"> 4. Identified injuries are managed in line with approved emergency care 5. Treatment is monitored, assessed and management plan amended appropriately in response to changes in condition of the casualty and/or environment 6. Additional or specific resources are identified
3. Implement emergency management procedures	<ul style="list-style-type: none"> 7. Immediate life saving treatment is administered as determined 8. Signs and symptoms of shock are recognised and managed 9. Vital signs are monitored and recorded at regular intervals 10. Equipment is used according to casualty's condition, availability and to organisation's procedures
4. Move the casualty	<ul style="list-style-type: none"> 11. Moving casualty to a safer location is assessed 12. Casualty is moved in accordance with operational standards 13. Continual assessment of casualty is conducted in accordance with organisation's procedures 14. Treatment is maintained while moving patient
5. Complete documentation	<ul style="list-style-type: none"> 15. Details of casualties' condition, treatment and response to treatment are accurately recorded in line with organisation's procedures 16. Hand over of the casualty and records to medical personnel is conducted

RANGE OF VARIABLES

Treatment may include monitor vital signs
management of shock
checking and maintaining an airway
application of spinal immobilisation techniques
applying resuscitation techniques
utilisation of oxygen
managing wounds
managing fractures
use of life saving devices
giving fluids orally
use of bandages

Equipment may include oxygen resuscitation
defibrillation
first aid kit
stretchers
spinal immobilisation collards
spinal immobilisation frames/devices
fracture immobilisation devices
stokes litter

Assessment may include environmental considerations
casualty triage
primary survey
vital signs survey
secondary survey (head to toe examination)
evacuation procedures
helicopter access
nearest land/wharf based access

Moving a casualty may include individually
as a member of a team

Management plan may include written
protocols
verbal
transmitted

Resources may include equipment
personnel

EVIDENCE GUIDE

Critical aspects of evidence It is essential for this unit that competence be demonstrated in the practical demonstration of emergency care skills including:
maintaining universal hygiene precautions
accurate documentation
observation and assessment skills
correct use of life saving equipment
appropriate management techniques for emergency encountered

Interdependent assessment of units Pre-requisite units: PUAEME001A Provide emergency care
Co-requisite units: Nil

Underpinning knowledge	<p>applying resuscitation techniques</p> <p>casualty assessment</p> <p>casualty management</p> <p>crush injury syndrome</p> <p>contraindications</p> <p>wound management</p> <p>basic toxicology</p> <p>environmental exposure</p> <p>spinal injuries</p> <p>head injuries</p> <p>shock: absolute</p> <p>hypovolaemic</p> <p>relative</p> <p>legal and ethical issues in pre-hospital care</p> <p>anatomy and physiology</p> <p>haemorrhage</p> <p>cardiovascular emergencies</p> <p>hypoxia</p> <p>triage</p> <p>documentation</p> <p>communicate with casualties</p> <p>remain calm under pressure</p> <p>knowledge of current practices and procedures in emergency care</p>
Underpinning skills	<p>communicate verbally with casualties and others</p> <p>provide reports to paramedical personnel</p> <p>work with others in a team situation</p> <p>remain calm under pressure</p> <p>assess casualty</p>
Resource implications	<p>Access to first aid equipment used in general operations is essential.</p> <p>Access may also be required to shore based transport, an ambulance or helicopter, depending on the context.</p>
Consistency of performance	<p>Evidence should be gathered over a period of time in a range of actual or simulated workplace environments</p>
Context of assessment	<p>A real life incident, exercise or simulation, or a series of tasks are required to demonstrate competence in this unit. This may involve setting scenarios to be completed either individually or as a member of a team or as part of an interagency exercise. Written or verbal questions may be used as supporting evidence.</p>

KEY COMPETENCY

Collect analyse & organise information	Communicate ideas and information	Plan and organise activities	Work with others and in teams	Use mathematical ideas and techniques	Solve problems	Use technology
1	1	1	1	1	2	1

UNIT NAME Administer oxygen in an emergency situation

UNIT CODE PUAEME003B

UNIT DESCRIPTOR This unit covers competency in advanced techniques for management of the administration of oxygen and ventilation of the lungs in line with the requirements of the Australian Resuscitation Council and State and Territory regulatory bodies. Expired air resuscitation is covered in the Pre-requisite unit *Provide emergency care*

ELEMENT	PERFORMANCE CRITERIA
1. Assess casualty and develop management plan	<ol style="list-style-type: none"> 1. Assessment of casualty is undertaken including vital signs, details of incident, medical/casualty history, physical appearance and other signs and symptoms 2. Management plan is developed taking into account available equipment, condition of patient and special requirements of certain conditions 3. Where possible casualty is assisted to a comfortable position suitable for implementation of management plan 4. Casualty is encouraged and reassured as necessary to facilitate effective treatment 5. Medical aid is arranged as soon as possible consistent with maintaining casualty safety
2. Check equipment	<ol style="list-style-type: none"> 1. Pre-use check of safety and potential effectiveness of equipment is undertaken in accordance with operating procedures 2. Australian standards and regulatory requirements 3. Minor faults are diagnosed and repairs are carried out in accordance with organisation procedures to restore equipment to working order 4. Faults and defects are reported/recorded according to organisational procedures
3. Maintain unobstructed airway	<ol style="list-style-type: none"> 1. Airway is cleared and maintained using non-intervention techniques where possible 2. Appropriate steps are taken to reduce risk to self or others of contamination by the casualty's body fluids 3. Where carried, suction apparatus is safely inserted into pharynx and suction initiated using approved techniques to avoid injuring casualty
4. Resuscitate casualty	<ol style="list-style-type: none"> 1. Where appropriate face masks and other barriers are used according to ARC standards
5. Use oxygen to provide therapy	<ol style="list-style-type: none"> 1. Where indicated, oxygen therapy is used in the ventilation of casualty
6. Recover and restore equipment	<ol style="list-style-type: none"> 1. Equipment is cleaned, and discarded or disinfected, restocked and/or replenished and stored safely according to organisation procedures

RANGE OF VARIABLES	
Advanced techniques for management of administration of oxygen and/or ventilation of the lungs are	oxygen therapy, ventilation of the lungs by expired air resuscitation without oxygen added using ancillary device ventilation with ambient air by an operator powered resuscitation—bag valve or mask ventilation by an oxygen powered resuscitator
Oxygen equipment is	equipment which is used for storage and delivery of oxygen for medical purposes
Resuscitation may be performed on	adults small children under eight years newborn babies or infants
Regulatory requirements may include	Australian Resuscitation Council relevant State and Territory regulatory bodies
Reporting/recording faults and damage may include	verbal filling out and processing standard form
Pre-use check may include	checking existence of suitable prominent warnings about precautions to be observed checking for damage to replenish and/or restore
Barriers may include	facemasks unidirectional valves bidirectional valves filters
Non-intervention techniques for maintenance of unobstructed airway may include	head tilt jaw support jaw thrust
Inserted into pharynx	no further than the back teeth
EVIDENCE GUIDE	
Critical aspects of evidence	use of oxygen equipment in accordance with relevant standards and guidelines
Interdependent assessment of units	Pre-requisite units: PUAEME001A – Provide emergency care Co-requisite units: Nil

Underpinning knowledge	respiratory system—lungs air passages importance of oxygen to the body causes of hypoxia and hypoxic hypoxia the mechanism of respiration possible causes of hypoventilation indicators of obstructed breathing significance of respiratory noises lower airways diseases signs and symptoms of chronic obstructed airways disease and chronic airways lesions (COAD/CAL) management of COAD/CAL casualties correct use of oxygen cylinders and devices estimation of duration of oxygen supply precautions for safe storage and handling of oxygen cylinders resuscitation and kits—specifications principles of operation and troubleshooting techniques for maintenance of unobstructed airway Australian Resuscitation Council standards <i>Australian Standards relevant to resuscitation equipment</i>
Underpinning skills	reading oxygen content gauges determining oxygen pressure and volume content of cylinders use of resuscitation equipment
Resource implications	Access to resuscitation equipment/kit is essential
Consistency of performance	Evidence will need to be gathered over time across a range of variables
Context of assessment	On the job or in a simulated work environment

KEY COMPETENCY

Collect analyse and organise information	Communicate ideas and information	Plan and organise activities	Work with others and in teams	Use mathematical ideas and techniques	Solve problems	Use technology
2	2	2	2	2	2	2

UNIT NAME	Operate communications systems and equipment
UNIT CODE	PUAOPE002A
UNIT DESCRIPTOR	This unit covers the competency to transmit and receive communications in routine and operational situations using the organisation's communication systems and equipment

ELEMENT	PERFORMANCE CRITERIA
1. Use communication systems and equipment	1. Equipment is used and operated safely to support communications consistent with organisation's policies and procedures 2. Communication equipment and techniques are selected to best meet the task, context and needs of the situation 3. The communication system is correctly utilised to facilitate transmission and reception 4. Communication systems are operationally maintained according to organisation's policies and procedures
2. Transmit and receive communications	5. Information is transmitted concisely and clearly to facilitate accurate reception of the message in accordance with organisation's policy and procedures 6. Contact is acknowledged, communication is confirmed and action initiated 7. Communication faults and deficiencies are reported according to organisation's policy and procedures 8. Alternative communication strategies are employed according to organisational procedures to address identified faults and deficiencies in communication 9. Communication is processed and recorded in accordance with organisation's policies and procedures
3. Maintain communications equipment	10. Fault finding techniques are applied and basic maintenance conducted according to organisational policies and procedures 11. Faulty equipment is identified and noted for repair

RANGE OF VARIABLES	
Communication equipment may include	personal computers and modems radio facsimiles signalling devices mobile landline and satellite telephones pagers
Communication systems may include	organisation's networks communication protocols verbal communication procedures geographical information systems relevant legislation such as Telecommunications Act

Verbal communication procedures may include	pro-words phonetic alphabet call signs coded messages use of abbreviations emergency procedures
Voice procedures may include	rhythm speed volume pitch sentences correcting mistakes repetitions

EVIDENCE GUIDE

Critical aspects of evidence	It is essential for this unit that competency be demonstrated in accurately transmitting and receiving communications using the organisation's communication system and equipment
Interdependent assessment of units	Pre-requisite units: Nil Co-requisite units: Nil
Underpinning knowledge	range of communication equipment available to the organisation the organisation's communication system organisational policy and procedures relevant to the operation of communication equipment
Underpinning skills	utilise the organisation's communication processes and systems use verbal communication procedures consistent with the organisation's communication system clean and service communication equipment according to organisational procedures report communication faults and deficiencies according to organisational procedures
Resource implications	access to relevant communication equipment
Consistency in performance	evidence should be gathered over a period of time in a range of actual or simulated workplace environments
Context of assessment	observation of the use of a range of communication equipment under non-operational and operational conditions or in a simulated environment

KEY COMPETENCY

Collect analyse and organise information	Communicate ideas and information	Plan and organise activities	Work with others and in teams	Use mathematical ideas and techniques	Solve problems	Use technology
2	2	2	1	1	1	2

SRO OPS 001A IMPLEMENT MINIMAL ENVIRONMENTAL IMPACT PRACTICES

OPS

Field operations

DESCRIPTION: This unit covers the basic knowledge and skills to ensure that practices are implemented to achieve minimal environmental impact whilst participating in outdoor activities under supervision.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Determine the environmental impacts of outdoor recreation activities</p>	<p>a. The <i>impacts</i> caused by participation in outdoor recreation activities are identified</p> <p>b. The possible causes of these <i>impacts</i> are determined</p> <p>c. The consequences of the <i>impact</i> on the <i>environment</i> are identified</p> <p>d. Information on <i>key practices and procedures</i> used to reduce the <i>impact</i> is sourced</p>
<p>2. Adopt minimal impact practices</p>	<p>a. <i>Minimal impact practices</i> and procedures, as recommended by land managers and peak activity groups, are used to reduce impact on the natural environment</p> <p>b. Equipment is used in a manner to reduce impact on the natural <i>environment</i></p> <p>c. Etiquette and appropriate behaviour are demonstrated when interacting with others in the immediate vicinity</p> <p>d. Use of heritage or cultural sites is in accordance with protocols, guidelines and/or directions from supervisors</p>

Range of Variables

IMPLEMENT MINIMAL ENVIRONMENTAL IMPACT PRACTICES

VARIABLE STATEMENT	CATEGORIES
1. Impacts	impacts on the environment may include: <ul style="list-style-type: none"> a. pollution with foreign matter (human waste, rubbish, soap, detergent) b. vegetation trampling and breakage c. breakage and dislodgment of rock and other formations d. compaction of soil and other deposits e. disturbance of fauna f. introduction of new flora and fauna g. chemical alteration of environments h. damage to, or inappropriate behaviour in, cultural sites i. graffiti j. reduction in decomposing timber k. campfire scars l. noise m. intrusion into private lives and culture n. development of facilities and signs
2. Key practices and procedures	<ul style="list-style-type: none"> a. restricting access b. limiting group size c. seasonal restrictions d. use of permits e. Codes of Ethics and Conduct
3. Minimal impact practices	<ul style="list-style-type: none"> a. avoidance of sensitive areas b. appropriate site and route selection c. limited party size d. removal of rubbish e. appropriate sanitation practices f. use of fuel stoves g. use of low impact equipment h. keeping to marked tracks or routes i. appropriate washing procedures j. respect and protection of heritage and cultural sites k. campfire management and rehabilitation
4. Workplace	<ul style="list-style-type: none"> a. includes locations/sites at which outdoor recreation

environment

- activities may be conducted, including:
 - a.1 land
 - a.2 water
 - a.3 air
 - a.4 underground
- b. includes those interacting in the environment, including:
 - b.1 flora and fauna
 - b.2 persons interacting in the immediate vicinity
- c. includes cultural and heritage sites

IMPLEMENT MINIMAL ENVIRONMENTAL IMPACT PRACTICES

<p>1. Critical aspects of evidence to be considered</p>	<ul style="list-style-type: none"> a. Assessment must confirm sufficient knowledge of the environmental impacts of at least one outdoor recreation activity area and the causes and consequences of those impacts b. Assessment of performance should be over a period of time covering all categories of minimal impact practice from the range of variables statement that are applicable in the learners environment c. In particular, assessment must confirm the ability to: <ul style="list-style-type: none"> c.1 Comply with general and activity-specific Codes of Ethics and/or Codes of Conservation c.2 Implement recommended minimal impact practices whilst participating in at least one type of outdoor recreation activity
<p>2. Interdependent assessment of units</p>	<ul style="list-style-type: none"> a. This unit must be assessed after attainment of competency in the following unit(s): <ul style="list-style-type: none"> a.1 Nil b. This unit must be assessed in conjunction with the following unit(s): <ul style="list-style-type: none"> b.1 SRO ORE 002A Participate in a supervised outdoor activity requiring basic skills b.2 Relevant units specific to a particular outdoor activity c. For the purpose of integrated assessment, this unit may be assessed in conjunction with other units
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Underpinning knowledge <ul style="list-style-type: none"> a.1 Minimal impact codes of ethics/conservation relevant to State / Territory and activity area a.2 Area restrictions and land management requirements a.3 Basic ecological principles, life cycles and interrelationships b. Underpinning skills <ul style="list-style-type: none"> b.1 Minimal impact practices
<p>4. Resource implications</p>	<ul style="list-style-type: none"> a. Assessment of this competency requires access to an outdoor environment whilst participating in an outdoor activity

	<ul style="list-style-type: none"> b. Assessment of this competency will require human resources consistent with those outlined in the Assessment Guidelines
5. Consistency in performance	<ul style="list-style-type: none"> a. Competence in this unit should be demonstrated whilst participating in an outdoor activity on more than one occasion in order to encounter the variety of impacts and minimal impact practices relevant to at least one area of outdoor activity
6. Context for assessment	<ul style="list-style-type: none"> a. Competency must be demonstrated whilst participating in an actual/real outdoor activity b. In cases where the learner does not have the opportunity to cover all categories of minimal impact practice from the range of variables statements in the work environment, the remainder should be assessed through realistic simulations, projects, previous relevant experience or oral questioning on “What if?” scenarios c. Assessment of this unit of competence will usually include observation of processes and procedures, oral and/or written questioning on underpinning knowledge and skills and consideration of required attitudes d. Where performance is not directly observed and/or is required to be demonstrated over a “period of time” and/or in a “number of locations”, any evidence should be authenticated by colleagues, supervisors, clients or other appropriate persons

KEY COMPETENCIES						
Collect, Analyse & Organise Information	Communicate Ideas & Information	Plan & Organise Activities	Work with Others & in Teams	Use Mathematical Ideas & Techniques	Solve Problems	Use Technology
1	1	1	1	-	-	-

SRO OPS 002A

PLAN FOR MINIMAL ENVIRONMENTAL IMPACT

OPS

Field operations

DESCRIPTION: This unit covers the knowledge and skills to plan outdoor activities to ensure that minimal environmental impact occurs.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Identify the interrelationships occurring within a natural environment</p>	<p>a. Key ecological concepts and their relationships within natural ecosystems are identified</p> <p>b. Natural processes and interrelationships occurring within natural environments are determined</p> <p>c. The manner in which interrelationships between natural processes can be affected is identified</p>
<p>2. Identify sources of environmental impact</p>	<p>a. Human impact through recreational activities on natural processes and interrelationships is determined</p> <p>b. Aspects unique to a specific environment are determined</p> <p>c. Sensitive areas are identified after consultation with appropriate authorities</p> <p>d. Information on the types of impact likely to occur during specific outdoor activities in specific locations is sourced</p>
<p>3. Plan for minimal impact</p>	<p>a. Current strategies implemented by land managers for environmental asset management are identified</p> <p>b. Compliance with land management principles and policies is demonstrated when planning the activity location/site</p> <p>c. Planning demonstrates consideration of suitability and appropriate use of a specific recreational setting for the proposed outdoor recreation activity</p>
<p>4. Implement methods to minimise impact</p>	<p>a. Activities are planned and conducted in a manner which minimises environmental impact</p> <p>b. Policies and management plans relevant to the activity area are complied with</p> <p>c. Activity aims are balanced with regard to achieving minimal impact</p> <p>d. Unique aspects and specific impacts likely to occur during an activity are communicated to other participants in the activity</p> <p>e. A positive and caring attitude to the natural environment is adopted throughout activities</p> <p>f. A cooperative stance on sharing of environmental resources is demonstrated</p>
<p>5. Monitor and review minimal impact practices</p>	<p>a. Basic techniques to determine the degree of impact are identified</p> <p>b. Effectiveness of minimal impact practices is evaluated using basic techniques</p> <p>c. Impact reduction strategies are modified, where necessary, after evaluation</p>

Range of Variables

PLAN FOR MINIMAL ENVIRONMENTAL IMPACT

VARIABLE STATEMENT	CATEGORIES
1. Authorities	<ul style="list-style-type: none"> a. relevant state and local government authorities (eg, National Parks and Wildlife Services) b. land owners
2. Basic techniques	<ul style="list-style-type: none"> a. observation b. questioning
3. Impact	<p>impacts on the environment may include:</p> <ul style="list-style-type: none"> a. pollution with foreign matter (human waste, rubbish, soap, detergent) b. vegetation tramping and breakage c. breakage and dislodgment of rock and other formations d. compacting of soil and other deposits e. disturbance of fauna f. introduction of new flora and fauna g. chemical alteration of environments h. damage to, or inappropriate behaviour in, cultural sites i. graffiti j. reduction in decomposing timber k. campfire scars l. noise m. intrusion into private lives and culture n. development of facilities and signs o. gates not left as required by landholders
4. Key ecological concepts	<ul style="list-style-type: none"> a. energy flow b. community c. diversity d. change e. adaptations f. biosphere g. interrelationships h. cycles
5. Management strategies	<ul style="list-style-type: none"> a. dispersal of use b. concentration of use c. site location d. site hardening or shielding e. type of use <ul style="list-style-type: none"> e.1 zoning e.2 size limitations
6. Processes and	<ul style="list-style-type: none"> a. food chains <ul style="list-style-type: none"> a.1 sun

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SROOPS002A Plan for Minimal Environmental Impact

interrelationships	<ul style="list-style-type: none">a.2 plantsa.3 herbivoresa.4 predatorsb. introduced speciesc. loss of habitatd. removal of speciese. selective enhancement of feeding opportunities
7. Resources	<ul style="list-style-type: none">a. waterb. spacec. hutsd. fires and wood for fuel
8. Unique aspects	<ul style="list-style-type: none">a. cavesb. archaeological, heritage and cultural sitesc. local traditionsd. protected arease. delicate/fragile formations and strataf. flora and fauna with restricted distribution
9. Work environment	<ul style="list-style-type: none">a. includes locations/sites at which outdoor recreation activities may be conducted, including:<ul style="list-style-type: none">a.1 landa.2 watera.3 aira.4 undergroundb. includes those interacting in the environment, including:<ul style="list-style-type: none">b.1 flora and faunab.2 persons interacting in the immediate vicinityc. includes cultural and heritage sites <p>Natural environment includes (a) and (b.1)</p>

PLAN FOR MINIMAL ENVIRONMENTAL IMPACT

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm sufficient knowledge of the following as the basis for planning activities that cause minimal impact:</p> <ul style="list-style-type: none"> a.1 Underpinning principles of ecology a.2 Underpinning principles of land management <p>b. Assessment of performance should be over a period of time covering all categories of the range of variable statements that are applicable in the learners environment</p> <p>c. In particular, assessment must confirm the ability to:</p> <ul style="list-style-type: none"> c.1 Apply knowledge of ecological concepts, processes, interrelationships and management strategies to plan activities that are appropriate to proposed location/site with respect to environmental impact c.2 Plan for minimal impact during at least one type of outdoor recreation activity
<p>2. Interdependent assessment of units</p>	<p>a. This unit must be assessed after attainment of competency in the following unit(s):</p> <ul style="list-style-type: none"> a.1 SRO OPS 001A Implement minimal environmental impact practices <p>b. This unit must be assessed in conjunction with the following unit(s):</p> <ul style="list-style-type: none"> b.1 SRO ORE 003A Prepare to participate in an outdoor activity b.2 SRO ORE 004A Participate in an outdoor activity <p>c. For the purpose of integrated assessment, this unit may be assessed in conjunction with units associated with participation in or conduct of outdoor activities</p>
<p>3. Required knowledge and skills</p>	<p>a. Underpinning knowledge</p> <ul style="list-style-type: none"> a.1 Minimum impact codes and practices a.2 Legal and statutory requirements (of Land Management Agencies) a.3 Specific problems of fragile environments or threatened species a.4 Area restrictions a.5 Limited knowledge of biological systems and their interrelationships a.6 Knowledge of factors affecting land management planning (eg, limits of acceptable change, recreation Succession) a.7 Familiarity with terms used in planning for appropriate use of sites/locations (recreational setting, recreational opportunity) <p>b. Underpinning skills</p> <ul style="list-style-type: none"> b.1 Minimal impact practices b.2 Research and evaluation of impact through observation and questioning
<p>4. Resource implications</p>	<p>a. Assessment of this competency requires access to an outdoor location suitable for the conduct of an outdoor recreation activity</p> <p>b. Assessment of this competency will require human resources consistent with those outlined in the Assessment</p>

	Guidelines
5. Consistency in performance	a. Competence in this unit must be assessed over a period of time to ensure consistency of performance and in order to encounter the variety of impacts and minimal impact practices relevant to at least one outdoor activity
6. Context for assessment	<p>a. Competency must be demonstrated whilst planning and participating in an actual/real outdoor activity</p> <p>b. In cases where the learner does not have the opportunity to cover all categories of the range of variables statements in the work environment, the remainder should be assessed through realistic simulations, projects, previous relevant experience or oral questioning on “What if?” scenarios</p> <p>c. Assessment of this unit of competence will usually include observation of processes and procedures, oral and/or written questioning on underpinning knowledge and skills and consideration of required attitudes</p> <p>d. Where performance is not directly observed and/or is required to be demonstrated over a “period of time” and/or in a “number of locations”, any evidence should be authenticated by colleagues, supervisors, clients or other appropriate persons</p>

KEY COMPETENCIES						
Collect, Analyse & Organise Information	Communicate Ideas & Information	Plan & Organise Activities	Work with Others & in Teams	Use Mathematical Ideas & Techniques	Solve Problems	Use Technology
3	1	3	1	-	2	-

SRO OPS 003A APPLY WEATHER INFORMATION

OPS Field operations

DESCRIPTION: This unit covers the basic knowledge and skills to access and interpret meteorological data in order to plan outdoor activities.

ELEMENT	PERFORMANCE CRITERIA
1. Apply weather information	<ul style="list-style-type: none">a. Identify <i>sources of relevant weather information</i>b. Obtain general <i>meteorological data</i>c. Access area specific information
2. Interpret weather information	<ul style="list-style-type: none">a. Interpret <i>meteorological data</i> in terms of likely weather conditions in areas which are to be used for an activityb. Interpret Bureau of Meteorology forecasts and warnings in terms of future weather conditions in areas which are to be used for an activityc. Assess <i>additional information</i> that is relevant to the predicted weatherd. Evaluate current and predicted weather conditions in terms of their effect on a planned outdoor activitye. Modify activity plans, if necessary, following consideration of weather information

Range of Variables

APPLY WEATHER INFORMATION

VARIABLE STATEMENT	CATEGORIES
1. Additional relevant information	<ul style="list-style-type: none"> a. river heights b. estimated water release from dams c. high and low tides d. snow cover
2. Meteorological data	<ul style="list-style-type: none"> a. synoptic charts b. satellite images c. daily and four day forecasts d. maximum and minimum temperatures e. rainfall f. snowfall g. barometric pressure h. warnings (wind, rain, storm, cyclone, hail, blizzard)
3. Sources of information	<ul style="list-style-type: none"> a. statutory bodies (eg, Bureau of Meteorology, Water Resources) b. media (newspapers, radio) c. National Parks and Wildlife Services d. Police e. local inhabitants f. motoring associations
4. Work environment	<ul style="list-style-type: none"> a. includes all situations, for example <ul style="list-style-type: none"> a.1 in a range of typical weather conditions a.2 at a range of different locations or sites b. includes locations/sites at which outdoor activities may be conducted, including: <ul style="list-style-type: none"> b.1 land (forested, desert, snowcovered) b.2 caves b.3 cliffs b.4 rivers b.5 underwater b.6 sheltered and open bodies of water (including oceans)

APPLY WEATHER INFORMATION

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm sufficient knowledge of types and sources of meteorological data in the work environment</p> <p>b. Assessment of performance should be over a period of time covering all categories of meteorological data and sources of information from the range of variable statements that are applicable in the learners environment</p> <p>c. In particular, assessment must confirm the ability to:</p> <p>c.1 Apply variables from within the range that are applicable to the activity-specific context to make reasonable predictions, based on different meteorological data.</p>
<p>2. Interdependent assessment of units</p>	<p>a. This unit must be assessed after attainment of competency in the following unit(s):</p> <p>a.1 Nil</p> <p>b. This unit must be assessed in conjunction with the following unit(s):</p> <p>b.1 Nil</p> <p>c. For the purpose of integrated assessment, this unit may be assessed in conjunction with the following unit(s):</p> <p>c.1 SRO ORE 003A Prepare to participate in outdoor activities</p>
<p>3. Required knowledge and skills</p>	<p>a. Underpinning knowledge</p> <p>a.1 Basic factors affecting global, regional and local climatic conditions</p> <p>a.2 Local climatic conditions and the effect of latitude</p> <p>a.3 Influence of local air masses, seasons and topography on weather</p> <p>a.4 Maritime influence on weather and climate</p> <p>a.5 Barometric pressure and its implications</p> <p>b. Underpinning skills</p> <p>b.1 Analysis of information</p> <p>b.2 Problem solving and decision making to determine the impact of meteorological data on planned activities</p> <p>b.3 Contingency planning</p>
<p>4. Resource implications</p>	<p>a. Assessment of this competency requires access to meteorological data and basic meteorological instruments</p> <p>b. Assessment of this competency will require human resources consistent with those outlined in the Assessment Guidelines</p>
<p>5. Consistency in performance</p>	<p>a. Competence in this unit must be assessed over a period of time in order to ensure consistency of performance in all variables from within the range applicable to a specific outdoor activity</p>

6. Context for assessment

- a. Competency may be demonstrated in a simulated work environment
- b. In cases where the learner does not have the opportunity to cover all categories of meteorological data and sources of information from the range of variable statements that are applicable in the learners environment, the remainder should be assessed through realistic simulations, projects, previous relevant experience or oral questioning on “What if?” scenarios
- c. Assessment of this unit of competence will usually include observation of processes and procedures, oral and/or written questioning on underpinning knowledge and skills and consideration of required attitudes
- d. Where performance is not directly observed and/or is required to be demonstrated over a “period of time” and/or in a “number of locations”, any evidence should be authenticated by colleagues, supervisors, clients or other appropriate persons. Assessment of this unit of competence will usually include oral and/or written questioning on underpinning knowledge and skills and analysis of meteorological data for specific locations and conditions

KEY COMPETENCIES						
Collect, Analyse & Organise Information	Communicate Ideas & Information	Plan & Organise Activities	Work with Others & in Teams	Use Mathematical Ideas & Techniques	Solve Problems	Use Technology
2	-	2	-	1	2	1

SRO OPS 005A APPLY SEARCH AND RESCUE SKILLS

OPS

Field operations

DESCRIPTION: This unit covers the knowledge and skills to conduct preliminary search and rescue procedures and determine the necessity for assistance.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Initiate a search/rescue</p>	<p>a. <i>Situation</i> and options are assessed.</p> <p>b. <i>Factors of an appreciation</i> are considered</p> <p>c. Appropriate information is obtained and documented.</p> <p>d. Safety of search/rescue party is considered and operational policies and procedures are implemented</p> <p>e. A workable response plan is developed and communicated to relevant persons</p> <p>f. An initial search and rescue is initiated</p> <p>g. The decision to locate and evacuate or call for assistance is soundly based and made without delay.</p>
<p>2. Carry out a search</p>	<p>a. The possible and probable search areas are defined, based on all available information including the missing party/person's <i>personal factors</i></p> <p>b. Communication processes and contingency plans are established and promulgated to all involved</p> <p>c. Search is conducted methodically, using appropriate <i>search techniques</i></p>
<p>3. Carry out a rescue</p>	<p>a. Where necessary, appropriate <i>rescue techniques</i> are used.</p> <p>b. Patient ambulatory status is determined and, if required, an <i>emergency evacuation structure</i> is built using available resources</p> <p>c. A process for constant monitoring of an injured person's condition and comfort is established and all actions taken are recorded</p> <p>d. <i>Situation</i> is assessed to determine whether to self evacuate or call for external assistance</p> <p>e. Injured party members are transported in a manner that minimises risk of further injury.</p> <p>f. Party members are advised to refer media enquiries to a nominated spokesperson</p>
<p>4. Assist in search and rescue</p>	<p>a. Situations requiring outside assistance are identified.</p> <p>b. Appropriate <i>search groups/agencies</i> are identified and the steps to alert them initiated</p> <p>c. Procedures for handing over a search and rescue to</p>

Metal and Engineering Training Package

SROOPS005A Apply Search and Rescue Skills

relevant authorities/agencies are implemented

Range of Variables

APPLY SEARCH AND RESCUE SKILLS

VARIABLE STATEMENT	CATEGORIES
1. Emergency evacuation structures	<ul style="list-style-type: none"> e. stretchers f. sleds
2. Factors of an appreciation	<ul style="list-style-type: none"> a. time frame for survival b. weather and topography c. other time factors d. human resources e. communications f. capacity of the missing person/party g. place and time last seen h. size of search area i. availability of food and water j. availability of shelter or emergency craft/life raft
3. Personal factors	<ul style="list-style-type: none"> e. expected speed of travel f. age g. sex h. physical condition i. experience j. weather k. intentions
4. Rescue techniques	<ul style="list-style-type: none"> g. mechanical advantage systems h. single rope techniques i. heaving lines j. flotation devices
5. Search groups/agencies	<ul style="list-style-type: none"> k. Police Search and Rescue l. State Emergency Service m. Resource Management Agency n. Ambulance Service o. Ski Patrol p. Federation of Mountain Rescue q. Volunteer marine rescue agencies
6. Search techniques	<ul style="list-style-type: none"> r. track or ridge scan s. check of likely shelter or water points t. line searching u. search along river bank v. spiral and sweep searches
7. Situation	<ul style="list-style-type: none"> g. lost person(s) h. injured party member requiring evacuation

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SROOPS005A Apply Search and Rescue Skills

8. Work environment	applies to all outdoor recreation activities, including <ol style="list-style-type: none">a. activities conducted at day or nightb. in a range of typical weather conditionsc. in confined areasd. in open and extensive environmentse. on land, on water and underwater
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APPLY SEARCH AND RESCUE SKILLS

<p>1. Critical aspects of evidence to be considered</p>	<ul style="list-style-type: none"> a. Assessment must confirm sufficient knowledge of search and rescue techniques within a land based or water-based activity area b. Assessment must confirm the ability to apply this knowledge to independently plan and organise suitable preliminary search and rescue procedures in order to determine the severity of the situation c. In particular, assessment must confirm the ability to organise suitable search and rescue procedures for a broad range of situations and circumstances, including <ul style="list-style-type: none"> c.1 injured person c.2 lost person/party c.3 either of the above in poor weather conditions c.4 either of the above, in situations where human and physical resources are limited c.5 where outside/expert assistance is required
<p>2. Interdependent assessment of units</p>	<ul style="list-style-type: none"> a. This unit must be assessed after attainment of competency in the following unit(s): <ul style="list-style-type: none"> a.1 PUA EME0 01A Provide emergency care b. This unit must be assessed in conjunction with the following unit(s): <ul style="list-style-type: none"> b.1 SRX EME 003A Respond to emergency situations c. For the purpose of integrated assessment, this unit may be assessed in conjunction with the following unit(s): <ul style="list-style-type: none"> c.1 Units incorporating activity-specific rescue competencies
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Underpinning knowledge <ul style="list-style-type: none"> a.1 Search and rescue procedures a.2 Local communication systems a.3 Operation of communication systems including portable radios, mobile telephones a.4 Safety procedures around helicopters a.5 Legal requirements in the event of a death a.6 First aid skills and long term patient monitoring procedures b. Underpinning skills <ul style="list-style-type: none"> b.1 Flexibility to change plans b.2 Adaptability and resourcefulness b.3 Capacity to handle media b.4 Problem solving and planning to organise an immediate response b.5 Questioning to determine accurate details concerning the situation b.6 Decision making to determine the best course of action
<p>4. Resource implications</p>	<ul style="list-style-type: none"> a. Assessment of this competency requires access to suitable outdoor environments in which to conduct simulated searches and rescues b. Assessment of this competency will require human resources consistent with those outlined in the Assessment

Metal and Engineering Training Package

SROOPS005A Apply Search and Rescue Skills

	Guidelines
5. Consistency in performance	a. Competence in this unit must be assessed over a period of time in order to ensure consistency of performance over the range of variables and contexts applicable
6. Context for assessment	<p>a. Competency must be demonstrated through realistic simulations</p> <p>b. In cases where the learner does not have the opportunity to cover all categories of the range of variables statements that are applicable to outdoor activities within the learner's work environment, the remainder should be assessed through realistic simulations, projects, previous relevant experience or oral questioning on “What if?” scenarios</p> <p>c. Assessment of this unit of competence will usually include observation of processes and procedures, oral and/or written questioning on underpinning knowledge and skills and consideration of required attitudes</p> <p>d. Where performance is not directly observed and/or is required to be demonstrated over a “period of time” and/or in a “number of locations”, any evidence should be authenticated by colleagues, supervisors, clients or other appropriate persons</p>

KEY COMPETENCIES						
Collect, Analyse & Organise Information	Communicate Ideas & Information	Plan & Organise Activities	Work with Others & in Teams	Use Mathematical Ideas & Techniques	Solve Problems	Use Technology
3	3	3	3	2	3	2

SRO OPS 006A USE AND MAINTAIN A TEMPORARY OR OVERNIGHT SITE

OPS Field operations

DESCRIPTION: This unit deals with the basic knowledge and skills to establish, use and maintain a temporary site.

ELEMENT	PERFORMANCE CRITERIA
1. Select a temporary site	<ul style="list-style-type: none"> a. Local area knowledge is accessed and used to identify suitable sites b. Additional <i>sources of information</i> to assist in site location are determined c. Factors affecting suitable <i>site selection</i> are identified d. The suitability of the site for the group size and objectives is considered
2. Establish a shelter	<ul style="list-style-type: none"> a. Hazards are identified and removed/avoided to reduce risks b. <i>Shelter is arranged appropriately for the prevailing weather and conditions</i> c. <i>Shelter</i> is established to ensure comfort and safety d. <i>Shelter</i> is erected in a manner to cause minimal environmental impact
3. Maintain a temporary site	<ul style="list-style-type: none"> a. Measures are taken, within the area of responsibility of the participant, to remove/avoid <i>hazards</i> and minimise risk at the temporary site b. Where relevant to the activity, <i>statutory and organisational procedures</i> with respect to the use of campfires are complied with c. Minimal impact practices are implemented with respect to camping or mooring and washing of self and utensils d. The consequences of unhygienic practices are identified e. Recommended procedures are followed to decrease potential health problems f. Individual and shared utensils are cleaned adequately g. Sanitation practices appropriate to the site and permit requirements are followed to minimise health problems and environmental impact

Range of Variables

USE AND MAINTAIN A TEMPORARY OR OVERNIGHT SITE

VARIABLE STATEMENT	CATEGORIES
1. General context	a. equipment for use at the site may be lightweight or heavyweight
2. Hazards	a. potential terrain hazards (loose debris, unstable or sloping terrain, sharp edges, slippery rocks, slippery decks, overhanging branches) b. environmental hazards (rising water levels, avalanches, storms, ice) c. people hazards (irresponsible use of campfires or stoves, irresponsible behaviour)
3. Shelters	include a. tents b. bivvies c. snow caves d. lean-to's e. mobile trailers and vans f. craft eg, yachts
4. Site selection	is affected by factors such as a. group size b. weather conditions c. time constraints d. degree of urgency e. type of shelter required f. access g. feeding and watering points of animals (domestic and native)
5. Sources of information	i. maps and charts j. guide books k. land management authorities l. port authorities m. local government authorities and councils
6. Statutory and organisational procedures	include a. permits from land management authorities/port authorities b. authority/permission from landowners, owners of wharves and jetties c. documented operating procedures and company/enterprise policies

USE AND MAINTAIN A TEMPORARY OR OVERNIGHT SITE

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm sufficient knowledge of site selection and maintenance in routine/controlled conditions using sites and shelter options applicable to a specific outdoor activity</p> <p>b. Assessment of performance should be over a period of time covering all categories of each range of variable statement applicable to the selection and use of site for a specific outdoor activity</p> <p>c. In particular, assessment must confirm the ability to:</p> <p>c.1 Select a suitable site for the activity after consideration of all relevant factors</p> <p>c.2 Establish safe shelter whilst causing minimal environmental impact</p> <p>c.3 Maintain a site in accordance with statutory and organisational procedures</p>
<p>2. Interdependent assessment of units</p>	<p>a. This unit must be assessed after attainment of competency in the following unit(s):</p> <p>a.1 Nil</p> <p>b. This unit must be assessed in conjunction with the following unit(s):</p> <p>b.1 SRO OPS 001A Implement minimal environmental impact practices</p> <p>b.2 Those relevant to participate in a specific outdoor recreation activity</p> <p>c. For the purpose of integrated assessment, this unit may be assessed in conjunction with other unit(s)</p>
<p>3. Required knowledge and skills</p>	<p>a. Underpinning knowledge</p> <p>a.1 Minimal impact codes and practices</p> <p>a.2 Sanitation procedures in outdoor environments</p> <p>a.3 Hazard identification</p> <p>a.4 Organisation and legislative requirements</p> <p>a.5 Shelter options and how to erect or moor them</p> <p>a.6 Weather information and how to apply it</p> <p>b. Underpinning skills</p> <p>b.1 Establishing/erecting shelter</p> <p>b.2 Applying weather information to determine suitable site locations</p>
<p>4. Resource implications</p>	<p>a. Assessment of this competency requires access to outdoor sites or moorings, activity-specific shelter options</p> <p>b. Assessment of this competency will require human resources consistent with those outlined in the Assessment Guidelines</p>

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SROOPS006A Use and Maintain a Temporary or Overnight Site

5. Consistency in performance	a. Competence in this unit must be assessed over a period of time in order to ensure consistency of performance in a range of sites and conditions
6. Context for assessment	<p>a. Competency must be demonstrated when camping or mooring at an outdoor location</p> <p>b. In cases where the learner does not have the opportunity to cover all categories of each range of variable statement applicable to the selection and use of site for a specific activities, the remainder should be assessed through realistic simulations, projects, previous relevant experience or oral questioning on "What if?" scenarios</p> <p>c. Assessment of this unit of competence will usually include observation of processes and procedures at a campsite, oral and/or written questioning on underpinning knowledge and skills and consideration of required attitudes</p> <p>d. Where performance is not directly observed and/or is required to be demonstrated over a "period of time" and/or in a number of locations, any evidence should be authenticated by colleagues, supervisors, clients or other appropriate persons</p>

KEY COMPETENCIES						
Collect, Analyse & Organise Information	Communicate Ideas & Information	Plan & Organise Activities	Work with Others & in Teams	Use Mathematical Ideas & Techniques	Solve Problems	Use Technology
2	1	2	1	1	2	1

SRO ORE 001A PREPARE TO PARTICIPATE IN A SUPERVISED OUTDOOR ACTIVITY REQUIRING BASIC SKILLS

ORE Outdoor recreation (generic)

DESCRIPTION: This unit covers the basic knowledge and skills to participate in supervised outdoor activities of limited duration in situations where extreme environmental conditions are not likely to occur.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Make logistical arrangements</p>	<ul style="list-style-type: none"> e. The suitability of the proposed activity site/location for personal objectives is evaluated to ensure appropriateness f. Local area knowledge is accessed and used to assist in the planning of transport and access g. Land management and relevant organisational/enterprise requirements are determined and complied with h. Where appropriate, specific sites within the designated activity location are identified and selected for use with reference to minimal impact on the environment i. Hazards associated with the activity are identified and risk minimisation procedures within the control of the participant are implemented during the planning and preparation
<p>2. Select suitable outdoor equipment</p>	<ul style="list-style-type: none"> a. Equipment needs are identified after consideration of contextual issues b. Sources of equipment are identified and evaluated according to needs c. Equipment is acquired a suitable time prior to the activity to allow for checking d. Equipment is checked for serviceability to ensure that it is in good working order e. Suitability of equipment to individual needs is confirmed f. Equipment is prepared for transportation to activity location in a manner to minimise loss or damage g. Where relevant to the activity, additional resources suitable to individual needs and the needs of the activity are identified, selected and prepared
<p>3. Identify and plan for food requirements</p>	<ul style="list-style-type: none"> a. Food requirements are correctly identified, based on principles of nutrition and energy requirements for a particular activity b. Factors affecting the choice of food within the activity constraints are identified c. Menu planning is appropriate for dietary requirements and personal tastes within the activity constraints d. Perishability of various foods, packaging and storage considerations are correctly addressed e. Emergency food requirements are identified and planned for f. Where relevant to the activity, food requirements of accompanying animals are determined and planned for
<p>4. Identify and plan for water needs and usage</p>	<ul style="list-style-type: none"> a. Fluid requirements are calculated, based on the requirements for a particular activity: b. Potential water sources are correctly identified c. Information on water purification techniques appropriate to the activity location is accessed d. Resources required for water purification are obtained e. Water is prepared for carrying and storage in a manner appropriate to

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SROORE001A Prepare to Participate in a Supervised Outdoor Activity Requiring Basic Skills

	<p>the activity and to minimise potential breakage of container</p> <p>f. Where relevant to the activity, water needs of accompanying animals are determined and planned for</p>
<p>5. Identify and plan clothing requirements</p>	<p>a. Sources of heat loss and causes of heat exhaustion /stroke during an activity are identified</p> <p>b. Clothing suitable to the activity is selected, based on consideration of contextual issues</p> <p>c. Where relevant to the activity, clothing is packed and stored in manner to ensure that it is waterproof</p>

Range of Variables

PREPARE TO PARTICIPATE IN A SUPERVISED OUTDOOR ACTIVITY REQUIRING BASIC SKILLS

VARIABLE STATEMENT	
	CATEGORIES
1. Activity constraints	a. all factors which may impact upon food and water requirements within a particular activity, including: a.1 weight constraints a.2 carrying capacity a.3 cooking method available a.4 water availability a.5 length/duration of activity a.6 temperature/season a.7 budget a.1.
2. Contextual issues	a. includes all factors which may impact upon the particular activity a.1 season a.2 activity location a.3 time of day a.4 weather a.5 length of activity a.6 budget a.7 participant size and ability a.8 weight constraints a.9 destination a.10 condition of terrain, activity location or medium a.11 group needs
3. Equipment	a. includes all aspects of equipment required for participation a.1 general outdoor equipment a.2 activity-specific equipment a.3 personal equipment a.4 safety equipment a.5 group equipment
4. General context	a. participation in outdoor activity is under supervision, generally within a team environment b. duration is dependant on the specific activity and may range from several hours for intense physical activities up to 2 days for other activities
5. Hazards	c. potential terrain hazards d. environmental hazards (heat, cold, rain, snow, flood) e. people hazards f. equipment failure
6. Impacts	g. includes impact on a.1 the natural environment a.2 other users a.3 cultural and heritage sites

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7. Relevant additional resources suitable to the activity	d. craft (eg, for SCUBA activities) e. backup vehicles (eg, for cycle touring) f. persons to drive craft or vehicles g. horses h. fuel
8. Workplace environment	h. includes all situations, for example a.1 in a range of typical weather conditions a.2 at a range of different locations or sites i. includes locations/sites at which outdoor activities may be conducted, including: b.7 land (forested, desert, snowcovered) b.8 oceans and coastal waters (on and underwater) b.9 caves b.10cliffs b.11 rivers and dams b.12artificial surfaces

PREPARE TO PARTICIPATE IN A SUPERVISED OUTDOOR ACTIVITY REQUIRING BASIC SKILLS

<p>7. Critical aspects of evidence to be considered</p>	<ul style="list-style-type: none"> i. Assessment must confirm sufficient knowledge of the factors influencing the selection and preparation (from a limited range provided) of equipment, food, fluid and clothing requirements for participation in a specific outdoor activity j. Assessment of performance should be over a period of time covering all categories of the range of variable statements that are applicable to planning for participation in a specific outdoor activity under supervision k. In particular, assessment must confirm the ability to <ul style="list-style-type: none"> c.1 Apply knowledge of factors affecting the activity context c.2 Plan for safe participation under supervision c.3 Assess contextual issues and activity constraints whilst planning c.4 Plan for possible contingencies c.5 Select suitable clothing and equipment from the range provided by supervisors or indicated in checklists
<p>8. Interdependent assessment of units</p>	<ul style="list-style-type: none"> c. This unit must be assessed after attainment of competency in the following unit(s): <ul style="list-style-type: none"> a.2 Nil d. This unit must be assessed in conjunction with the following unit(s): <ul style="list-style-type: none"> b.1 SRO ORE 002A Participate in a supervised outdoor activity requiring basic skills b.2 Relevant units specific to the particular outdoor activity d. For the purpose of integrated assessment, this unit may be assessed in conjunction with other units
<p>9. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Underpinning knowledge <ul style="list-style-type: none"> a.1 Activity specific knowledge a.2 Minimal impact codes and practices a.3 Factors that affect physiological well-being a.4 Factors affecting general equipment selection <ul style="list-style-type: none"> a.4.1 Advantages a.4.2 Disadvantages a.4.3 Cost a.5 Factors affecting activity specific equipment choice <ul style="list-style-type: none"> a.5.1 Fabric or construction materials and features/limitations a.5.2 Weight a.5.3 Ability to repair a.5.4 Cost a.6 Dietary requirements, and their source a.7 Types of food available to suit activity constraints a.8 Clothing requirements for specific activities a.9 Hazard identification a.10 Land management and legislative requirements b. Underpinning skills <ul style="list-style-type: none"> b.1 Activity specific skills

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10. Resource implications	<ul style="list-style-type: none"> a. Assessment of this competency requires access to outdoor equipment, clothing, associated resources and information on typical outdoor activity locations/venues b. Assessment of this competency will require human resources consistent with those outlined in the Assessment Guidelines
11. Consistency in performance	<ul style="list-style-type: none"> a. Competence in this unit needs to be assessed over a period of time to ensure consistency of performance in a range of contexts applicable to a specific outdoor activity
12. Context for assessment	<ul style="list-style-type: none"> a. Competency must be demonstrated when planning for participation in an actual/real outdoor activity b. In cases where the learner does not have the opportunity to cover all categories of the range of variable statements that are applicable to planning for participation in a specific outdoor activity under supervision, the remainder should be assessed through realistic simulations, projects, previous relevant experience or oral questioning on "What if?" Scenarios c. Assessment of this unit of competence will usually include observation of processes and procedures, oral and/or written questioning on underpinning knowledge and skills and consideration of required attitudes d. Where performance is not directly observed and/or is required to be demonstrated over a "period of time" and/or in a "number of locations", any evidence should be authenticated by colleagues, supervisors, clients or other appropriate persons

KEY COMPETENCIES						
Collect, Analyse & Organise Information	Communicate Ideas & Information	Plan & Organise Activities	Work with Others & in Teams	Use Mathematical Ideas & Techniques	Solve Problems	Use Technology
1	1	1	1	1	1	1

SRO ORE 002A PARTICIPATE IN A SUPERVISED OUTDOOR ACTIVITY REQUIRING BASIC SKILLS

ORE Outdoor recreation (generic)

DESCRIPTION: This unit covers the basic knowledge and skills to participate in supervised outdoor activities of limited duration in situations where extreme environmental conditions are not likely to occur.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Use outdoor equipment correctly</p>	<ul style="list-style-type: none"> a. Storage and transport of <i>equipment</i> is such that loss or damage is minimised b. <i>Equipment</i> is used in accordance with supervisor’s directions and operational procedures ensure that design limits are not exceeded c. Where necessary, <i>equipment</i> is adjusted and/or fitted correctly to ensure comfort and safety d. <i>Equipment</i> suitability to prevailing conditions and individual needs is assessed e. <i>Equipment</i> is used in a manner to minimise environmental impact and damage f. <i>Equipment</i> is monitored for wear and damage during use and prior to storage and damaged <i>equipment</i> is referred to the appropriate person g. <i>Equipment</i> is stored in a suitable manner according to organisational procedures and supervisor’s directions
<p>2. Maintain physiological well-being</p>	<ul style="list-style-type: none"> a. Food intake suitable for the conditions and type of activity is maintained to enable continued participation at an effective level b. Nourishing meals or snacks are prepared within the constraints of the activity and prevailing conditions c. Where relevant to the activity and situation, individual and small group cooking skills are demonstrated using stoves d. Water purification methods, where applicable, are correctly applied e. Regular fluid intake appropriate to the activity requirements is maintained and water conservation techniques, where necessary, are demonstrated f. Potential medical problems due to heat or cold are identified and clothing and protective garments are worn/removed in accordance with changing environmental conditions in order to maintain physiological well-being g. Where relevant to the activity, loads are kept within the capacity of each individual h. Physiological needs of accompanying animals are catered

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SROORE002A Participate in a Supervised Outdoor Activity Requiring Basic Skills

	to, where relevant to the outdoor activity
3. Participate in an outdoor activity	<ul style="list-style-type: none">j. Statutory and organisational procedures are complied withk. Temporary sites, where required, are established to ensure comfort and safetyl. General and activity-specific minimal environmental impact practices are implementedm. Measures are taken, within the area of responsibility of the participant, to remove/avoid hazards and minimise risk

Range of Variables

PARTICIPATE IN A SUPERVISED OUTDOOR ACTIVITY REQUIRING BASIC SKILLS

VARIABLE STATEMENT	CATEGORIES
1. Equipment	a. includes all aspects of equipment required for participation <ul style="list-style-type: none"> a.1 general outdoor equipment a.2 activity-specific equipment a.3 personal equipment a.4 safety equipment a.5 group equipment
2. General context	a. participation in outdoor activity is under supervision, generally within a team environment b. duration is dependant on the specific activity and may range from several hours for intense physical activities up to 2 days for other activities
3. Hazards	a. potential terrain hazards b. environmental hazards (heat, cold, rain, snow, flood, fire, storms, ice) c. people hazards d. equipment failure
4. Statutory and organisational procedures	a. include <ul style="list-style-type: none"> a.1 permits from land management authorities a.2 authority/permission from landowners a.3 documented operating procedures and company/enterprise policies
5. Temporary sites	a. includes sites used as <ul style="list-style-type: none"> a.1 rest stops a.2 activity sites a.3 temporary or overnight shelter
6. Workplace environment	a. includes all situations, for example <ul style="list-style-type: none"> a.1 in a range of typical weather conditions a.2 at a range of different locations or sites b. includes locations/sites at which outdoor activities may be conducted, including: <ul style="list-style-type: none"> b.1 land (forested, desert, snowcovered) b.2 oceans and coastal waters (on or below) b.3 caves b.4 cliffs b.5 rivers and dams b.6 artificial surfaces

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SROORE002A Participate in a Supervised Outdoor Activity Requiring Basic Skills

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PARTICIPATE IN A SUPERVISED OUTDOOR ACTIVITY REQUIRING BASIC SKILLS

<p>1. Critical aspects of evidence to be considered</p>	<ul style="list-style-type: none"> a. Assessment must confirm sufficient knowledge of equipment use and maintenance of physiological well-being in an activity-specific context in order to safely participate under supervision in routine/controlled conditions. b. Assessment of performance should be over a period of time covering all categories of each range of variable statements that are applicable to participating in a specific outdoor activity under supervision c. In particular, assessment must confirm the ability to: <ul style="list-style-type: none"> c.3 Use the provided equipment correctly c.4 Maintain physiological well-being in the range of environmental contexts encountered c.5 Identify hazards and take appropriate action to minimise the risk of injury c.6 Comply with statutory and organisational procedures c.7 Use sites appropriately to minimise impact
<p>2. Interdependent assessment of units</p>	<ul style="list-style-type: none"> a. This unit must be assessed after attainment of competency in the following unit(s): <ul style="list-style-type: none"> a.1 Nil b. This unit must be assessed in conjunction with the following unit(s): <ul style="list-style-type: none"> b.1 SRO ORE 001A Prepare to participate in a supervised outdoor activity requiring basic skills b.2 SRO OPS 001A Implement minimum environmental impact practices b.3 Relevant units specific to the particular outdoor activity, at a basic skill level c. For the purpose of integrated assessment, this unit may be assessed in conjunction with the following unit(s): <ul style="list-style-type: none"> c.2 SRO OPS 006A Use and maintain a temporary or overnight site
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Underpinning knowledge <ul style="list-style-type: none"> a.1 Activity specific knowledge a.2 Minimal impact codes and practices a.3 Factors that affect physiological well-being a.4 Types of fuel stoves available a.5 Advantages and disadvantages of various fuel stoves a.6 General equipment use a.7 Activity specific equipment use

	<p>a.8 Hazard identification</p> <p>a.9 Land management and legislative requirements</p> <p>a.10 Water purification methods</p> <p>a.11 Principles of fluid balance and intake</p> <p>a.12 Effect of weather conditions on performance and requirements</p> <p>b. Underpinning skills</p> <p>b.1 Activity specific skills</p> <p>b.2 Food preparation</p> <p>b.3 Cooking of fuel stoves</p>
4. Resource implications	<p>a. Assessment of this competency requires access to outdoor equipment, clothing, associated resources and activity-specific venues.</p> <p>b. Assessment of this competency will require human resources consistent with those outlined in the Assessment Guidelines</p>
5. Consistency in performance	<p>a. Competence in this unit may need to be assessed over a period of time to ensure consistency of performance in the range of contexts applicable to a specific outdoor activity</p>
6. Context for assessment	<p>a. Competency must be demonstrated when participating in an actual/real outdoor activity</p> <p>b. In cases where the learner does not have the opportunity to cover all categories of each range of variable statements that are applicable to participating in a specific outdoor activity under supervision, the remainder should be assessed through realistic simulations, projects, previous relevant experience or oral questioning on “What if?” Scenarios</p> <p>c. Assessment of this unit of competence will usually include observation of processes and procedures, oral and/or written questioning on underpinning knowledge and skills and consideration of required attitudes</p> <p>d. Where performance is not directly observed and/or is required to be demonstrated over a “period of time” and/or in a “number of locations”, any evidence should be authenticated by colleagues, supervisors, clients or other appropriate persons</p>

KEY COMPETENCIES						
Collect, Analyse & Organise Information	Communicate Ideas & Information	Plan & Organise Activities	Work with Others & in Teams	Use Mathematical Ideas & Techniques	Solve Problems	Use Technology
1	1	1	1	-	1	1

SRO ORE 003A PREPARE TO PARTICIPATE IN OUTDOOR ACTIVITIES

ORE Outdoor recreation (generic)

DESCRIPTION: This unit covers the knowledge and skills to independently participate in outdoor activities in situations where extreme environmental conditions are not likely to occur.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Make logistical arrangements</p>	<ul style="list-style-type: none"> a. The suitability of the proposed activity site/location for personal objectives is evaluated to ensure appropriateness b. Local area knowledge is accessed and used to assist in the planning of transport and access c. Land management and relevant organisational/enterprise requirements are determined and complied with d. Where appropriate, specific sites within the designated activity location are identified and selected for use with reference to minimal impact on the environment e. Hazards associated with the activity are identified and risk minimisation procedures within the control of the participant are implemented during the planning and preparation
<p>2. Select suitable outdoor equipment</p>	<ul style="list-style-type: none"> a. Equipment needs are identified after consideration of contextual issues b. Sources of equipment are identified and evaluated according to needs c. Equipment is acquired a suitable time prior to the activity to allow for checking d. Equipment is checked for serviceability to ensure that it is in good working order e. Compliance of equipment with relevant legislation, manufacturer's specifications and accepted industry practice is checked f. Suitability of equipment to individual needs is confirmed g. Equipment is prepared for transportation to activity location in a manner to minimise loss or damage h. Where relevant to the activity, additional resources suitable to individual needs and the needs of the activity are identified, selected and prepared
<p>3. Identify and plan for food requirements</p>	<ul style="list-style-type: none"> a. Food requirements are correctly identified, based on principles of nutrition and energy requirements for a particular activity b. Factors affecting the choice of food within the activity constraints are identified c. Menu planning is appropriate for dietary requirements and personal tastes within the activity constraints d. Perishability of various foods, packaging and storage considerations are correctly addressed e. Emergency food requirements are identified and planned for f. Where relevant to the activity, food requirements of accompanying animals are determined and planned for
<p>4. Identify and plan for water needs and usage</p>	<ul style="list-style-type: none"> a. Fluid requirements are calculated, based on the requirements for a particular activity: b. Potential water sources are correctly identified c. Information on water purification techniques appropriate to the activity location is accessed

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	<ul style="list-style-type: none">d. Resources required for water purification are obtainede. Water is prepared for carrying and storage in a manner appropriate to the activity and to minimise potential breakage of containerf. Where relevant to the activity, water needs of accompanying animals are determined and planned for
5. Identify and plan clothing requirements	<ul style="list-style-type: none">a. Sources of heat loss and causes of heat exhaustion /stroke during an activity are identifiedb. Clothing suitable to the activity is selected, based on consideration of contextual issuesc. Where relevant to the activity, clothing is packed and stored in manner to ensure that it is waterproof

Range of Variables

PREPARE TO PARTICIPATE IN OUTDOOR ACTIVITIES

VARIABLE STATEMENT	CATEGORIES
<p>1. Activity constraints</p>	<p>a. all factors which may impact upon food and water requirements within</p> <ul style="list-style-type: none"> a.1 particular activity, including: a.2 weight constraints a.3 carrying capacity a.4 cooking method available a.5 water availability a.6 length/duration of activity a.7 temperature/season a.8 budget <p>a.3.</p>
<p>2. Contextual issues</p>	<p>a. includes all factors which may impact upon the particular activity</p> <ul style="list-style-type: none"> a.1 season a.2 activity location a.3 time of day a.4 weather a.5 length of activity a.6 budget a.7 participant size and ability a.8 weight constraints a.9 destination a.10 condition of terrain, activity location or medium a.11 group needs
<p>3. Equipment</p>	<p>a. includes all aspects of equipment required for participation</p> <ul style="list-style-type: none"> a.1 general outdoor equipment a.2 activity-specific equipment a.3 personal equipment a.4 safety equipment a.5 group equipment
<p>4. General context</p>	<ul style="list-style-type: none"> a. participation in outdoor activity is independent, generally within a team environment b. duration is dependant on the specific activity and may range from several hours for intense physical activities up to 2 days for other activities c. participation may include overnight camping d. extreme environmental conditions are not likely to occur
<p>5. Hazards</p>	<ul style="list-style-type: none"> j. potential terrain hazards k. environmental hazards (heat, cold, rain, snow, flood) l. people hazards
<p>6. Impacts</p>	<ul style="list-style-type: none"> m. includes impact on <ul style="list-style-type: none"> a.1 the natural environment

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	<ul style="list-style-type: none">a.2 other usersa.3 cultural and heritage sites
7. Relevant additional resources suitable to the activity	<ul style="list-style-type: none">l. craft (eg, for SCUBA activities)m. backup vehicles (eg, for cycle touring)n. persons to drive craft or vehicleso. horsesp. fuel
8. Workplace environment	<ul style="list-style-type: none">n. includes all situations, for example<ul style="list-style-type: none">a.1 in a range of typical weather conditionsa.2 at a range of different locations or siteso. includes locations/sites at which outdoor activities may be conducted, including:<ul style="list-style-type: none">b.1 land (forested, desert, snowcovered)b.2 oceans and coastal waters (on and underwater)b.3 cavesb.4 cliffsb.5 rivers and damsb.6 artificial surfaces

PREPARE TO PARTICIPATE IN OUTDOOR ACTIVITIES

<p>1. Critical aspects of evidence to be considered</p>	<ul style="list-style-type: none"> a. Assessment must confirm knowledge of the factors influencing the selection and preparation of equipment, food, fluid and clothing requirements for participation in outdoor activities within a specific activity area (eg, bushwalking, cycling, rockclimbing) b. Assessment of performance should be over a period of time covering all categories of the range of variable statements that are applicable to planning for participation in a specific outdoor activity in conditions as specified in the General Context in the Range of Variables in a range of typical weather conditions at a range of different locations or sites c. In particular, assessment must confirm the ability to <ul style="list-style-type: none"> c.1 Apply knowledge of factors affecting the activity context in order to plan for safe participation c.2 Apply depth of knowledge of equipment and clothing suitable to the activity in different contexts c.3 Discriminate between features of relevant equipment and clothing c.4 Define requirements for specific needs c.5 Select the most appropriate equipment, food and clothing c.6 Plan for contingencies
<p>2. Interdependent assessment of units</p>	<ul style="list-style-type: none"> a. This unit must be assessed after attainment of competency in the following unit(s): <ul style="list-style-type: none"> a.1 SRO ORE 001A Prepare to participate in a supervised outdoor activity requiring basic skills b. This unit must be assessed in conjunction with the following unit(s): <ul style="list-style-type: none"> b.1 SRO ORE 003A Participate in outdoor activities b.2 SRO OPS 002A Plan for minimal environmental impact b.3 Relevant units, at an equivalent level of autonomy, specific to the particular outdoor activity c. For the purpose of integrated assessment, this unit may be assessed in conjunction with other activity-specific units
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Underpinning knowledge <ul style="list-style-type: none"> a.1 Activity specific knowledge a.2 Minimal impact codes and practices a.3 Factors that affect physiological well-being a.4 Factors affecting general equipment selection <ul style="list-style-type: none"> a.4.1 Advantages a.4.2 Disadvantages a.4.3 Cost a.5. Factors affecting activity specific equipment choice <ul style="list-style-type: none"> a.5.1 Fabric or construction materials and features/limitations a.5.2 Weight a.5.3 Ability to repair a.5.4 Cost a.6 Dietary requirements, and their source a.7 Types of food available to suit activity constraints a.8 Clothing requirements for specific activities a.9 Hazard identification a.10 Land management and legislative requirements

	<ul style="list-style-type: none"> b. Underpinning skills <ul style="list-style-type: none"> b.1 Activity specific skills
4. Resource implications	<ul style="list-style-type: none"> a. Assessment of this competency requires access to outdoor equipment, clothing, associated resources and information on typical outdoor activity locations/venues b. Assessment of this competency will require human resources consistent with those outlined in the Assessment Guidelines
5. Consistency in performance	<ul style="list-style-type: none"> a. Competence in this unit needs to be assessed over a period of time to ensure consistency of performance in a range of contexts applicable to a specific outdoor activity
6. Context for assessment	<ul style="list-style-type: none"> a. Competency must be demonstrated when planning for participation in an actual/real outdoor activity b. In cases where the learner does not have the opportunity to cover all categories of the range of variable statements that are applicable to planning for participation in a specific outdoor activity in conditions as specified in the General Context in the Range of Variables in a range of typical weather conditions at a range of different locations or sites, the remainder should be assessed through realistic simulations, projects, previous relevant experience or oral questioning on “What if?” scenarios c. Assessment of this unit of competence will usually include observation of processes and procedures, oral and/or written questioning on underpinning knowledge and skills and consideration of required attitudes d. Where performance is not directly observed and/or is required to be demonstrated over a “period of time” and/or in a “number of locations”, any evidence should be authenticated by colleagues, supervisors, clients or other appropriate persons

KEY COMPETENCIES						
Collect, Analyse & Organise Information	Communicate Ideas & Information	Plan & Organise Activities	Work with Others & in Teams	Use Mathematical Ideas & Techniques	Solve Problems	Use Technology
2	1	2	2	1	2	1

SRO ORE 004A PARTICIPATE IN OUTDOOR ACTIVITIES

ORE Outdoor recreation (generic)

DESCRIPTION: This unit covers the knowledge and skills to independently participate in outdoor activities in situations where extreme environmental conditions are not likely to occur. Additional competencies which may be required (eg, campcraft, activity-specific competencies) are defined in other units.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Use outdoor equipment correctly</p>	<ul style="list-style-type: none"> a. Storage and transport of <i>equipment</i> is such that loss or damage is minimised b. <i>Equipment</i> is used in accordance with manufacturer’s specifications or accepted industry practice to ensure that design limits are not exceeded c. Where necessary, <i>equipment</i> is adjusted and/or fitted correctly to ensure comfort and safety d. <i>Equipment</i> suitability to prevailing conditions and individual needs is assessed e. <i>Equipment</i> is used in a manner to minimise environmental impact and damage f. <i>Equipment</i> is monitored for wear and damage during use and prior to storage g. Damaged <i>equipment</i> is assessed for repair or replacement and returned to the appropriate person h. <i>Equipment</i> is stored in a suitable manner according to organisational procedures and/or manufacturer’s recommendations
<p>2. Maintain physiological well-being</p>	<ul style="list-style-type: none"> a. Food intake suitable for the conditions and type of activity is maintained to enable continued participation at an effective level b. Nourishing meals or snacks are prepared within the constraints of the activity and prevailing conditions c. Where relevant to the activity and situation, individual and small group cooking skills are demonstrated using stoves d. Water purification methods, where applicable, are correctly applied e. Regular fluid intake appropriate to the activity requirements is maintained and water conservation techniques, where necessary, are demonstrated f. Potential medical problems due to heat or cold are identified g. Clothing and protective garments are worn/removed in accordance with changing environmental conditions in order to maintain physiological well-being

	<ul style="list-style-type: none"> h. Where relevant to the particular outdoor activity, loads are kept within the capacity of each individual i. Physiological needs of accompanying animals are catered to, where relevant to the outdoor activity
<p>3. Participate in an outdoor activity</p>	<ul style="list-style-type: none"> a. Statutory and organisational procedures are complied with b. Temporary sites, where required, are established to ensure comfort and safety c. General and activity-specific minimal environmental impact practices are implemented d. Measures are taken, within the area of responsibility of the participant, to remove/avoid hazards and minimise risk
<p>4. Deal with non-routine situations</p>	<ul style="list-style-type: none"> a. The non-routine situation is assessed and the need for improvised equipment or techniques is established b. Current resources that can be used for improvised techniques or equipment are identified c. Consideration is given to the ability to acquire new or additional resources d. The ability to improvise with current resources whilst maintaining the safety of the activity is evaluated e. The ability to improvise equipment and/or techniques to deal with non-routine situations is demonstrated f. The activity is modified, where necessary, to accommodate the use of improvised equipment or circumstances

Range of Variables

PARTICIPATE IN OUTDOOR ACTIVITIES

VARIABLE STATEMENT	CATEGORIES
<p>1. Equipment</p>	<p>a. includes all aspects of equipment required for participation</p> <ul style="list-style-type: none"> a.1 general outdoor equipment a.2 activity-specific equipment a.3 personal equipment a.4 safety equipment a.5 group equipment
<p>2. General context</p>	<ul style="list-style-type: none"> a. participation in outdoor activity is independent, generally within a team environment b. duration is dependant on the specific activity and may range from several hours for intense physical activities up to two days for other activities c. extreme environmental conditions are not likely to occur
<p>3. Hazards</p>	<ul style="list-style-type: none"> a. potential terrain hazards b. environmental hazards (heat, cold, rain, snow, flood, fire, storms, ice) c. people hazards
<p>4. Improvised equipment</p>	<ul style="list-style-type: none"> a. repaired equipment b. protective clothing c. shelters d. first aid resources (eg, slings, bandages) e. improvised equipment f. emergency response resources (eg, stretchers, splints)
<p>5. Non routine situations</p>	<ul style="list-style-type: none"> a. lost or damaged equipment b. unseasonal weather conditions c. injuries d. emergencies e. communication breakdowns f. phobias and panic in other group members g. characteristics of other group members (weight, size, physical ability, cultural background)
<p>6. Statutory and organisational procedures</p>	<ul style="list-style-type: none"> a. include <ul style="list-style-type: none"> a.1 permits from land management authorities a.2 authority/permission from landowners a.3 documented operating procedures and company/enterprise policies
<p>7. Temporary sites</p>	<ul style="list-style-type: none"> a. includes sites used as <ul style="list-style-type: none"> a.1 rest stops

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	<ul style="list-style-type: none">a.2 activity sitesa.3 temporary sheltera.4 overnight resting stops
8. Workplace environment	<ul style="list-style-type: none">a. includes all situations, for example<ul style="list-style-type: none">a.1 in a range of typical weather conditionsa.2 at a range of different locations or sites b. includes locations/sites at which outdoor activities may be conducted, including:<ul style="list-style-type: none">b.1 land (forested, desert, snowcovered)b.2 oceans and coastal waters (on and underwater)b.3 cavesb.4 cliffsb.5 rivers and damsb.6 artificial surfaces

PARTICIPATE IN OUTDOOR ACTIVITIES

<p>1. Critical aspects of evidence to be considered</p>	<ul style="list-style-type: none"> a. Assessment must confirm sufficient knowledge of correct equipment usage and procedures for safe participation in outdoor activities, in an activity-specific context b. Assessment of performance should be over a period of time covering all categories of the range of variable statements that are applicable to participating in a specific outdoor activity in conditions as specified in the General Context in the Range of Variables in a range of typical weather conditions at a range of different locations or sites c. In particular, assessment must confirm the ability, in an activity-specific context, to <ul style="list-style-type: none"> c.1 Operate independently (as part of a group or team) in both routine and predictable non-routine situations c.2 Use knowledge of equipment to select and use that which is most appropriate in an activity-specific context c.3 Establish and maintain in a safe manner all categories of temporary site relevant to the activity, minimising environmental impact c.4 Maintain personal physiological well-being during activities in a range of typical weather conditions
<p>2. Interdependent assessment of units</p>	<ul style="list-style-type: none"> a. This unit must be assessed after attainment of competency in the following unit(s): <ul style="list-style-type: none"> a.1 SRO ORE 001A Prepare to participate in a supervised outdoor activity requiring basic skills a.2 SRO ORE 002A Participate in a supervised outdoor activity requiring basic skills a.3 SRO OPS 001A Implement minimum environmental impact practices b. This unit must be assessed in conjunction with the following unit(s): <ul style="list-style-type: none"> b.3 SRO ORE 003A Prepare to participate in outdoor activities b.4 Relevant units specific to the particular outdoor activity, at a basic skill level c. For the purpose of integrated assessment, this unit may be assessed in conjunction with the following unit(s): <ul style="list-style-type: none"> c.1 SRO OPS 003A Apply weather information c.2 SRO NAV 002A Navigate in untracked areas c.3 Other relevant units specific to the particular outdoor activity
<p>3. Required</p>	<ul style="list-style-type: none"> a. Underpinning knowledge

<p>knowledge and skills</p>	<ul style="list-style-type: none"> a.1 Activity specific knowledge a.2 Minimal impact codes and practices a.3 Factors that affect physiological well-being a.4 Types of fuel stoves available a.5 Advantages and disadvantages of various fuel stoves a.6 General equipment use a.7 Activity specific equipment use a.8 Hazard identification a.9 Land management and legislative requirements a.10 Water purification methods a.11 Principles of fluid balance and intake a.12 Effect of weather conditions on performance and requirements <ul style="list-style-type: none"> b. Underpinning skills <ul style="list-style-type: none"> b.1 Activity specific skills b.2 Food preparation b.3 Cooking on fires/fuel stoves
<p>4. Resource implications</p>	<ul style="list-style-type: none"> a. Assessment of this competency requires access to outdoor equipment, clothing, associated resources and activity-specific venues. b. Assessment of this competency will require human resources consistent with those outlined in the Assessment Guidelines
<p>5. Consistency in performance</p>	<ul style="list-style-type: none"> a. Competence in this unit needs to be assessed over a period of time to ensure consistency of performance in a range of contexts applicable to a specific outdoor activity
<p>6. Context for assessment</p>	<ul style="list-style-type: none"> a. Competency must be demonstrated when participating in an actual/real outdoor activity b. In cases where the learner does not have the opportunity to cover all categories of the range of variable statements that are applicable to participating in a specific outdoor activity in conditions as specified in the General Context in the Range of Variables in a range of typical weather conditions at a range of different locations or sites, the remainder should be assessed through realistic simulations, projects, previous relevant experience or oral questioning on "What if?" Scenarios c. Assessment of this unit of competence will usually include observation of processes and procedures, oral and/or written questioning on underpinning knowledge and skills and consideration of required attitudes d. Where performance is not directly observed and/or is required to be demonstrated over a "period of time" and/or in a "number of locations", any evidence should be authenticated by colleagues, supervisors, clients or other appropriate persons

KEY COMPETENCIES						
Collect, Analyse & Organise Information	Communicate Ideas & Information	Plan & Organise Activities	Work with Others & in Teams	Use Mathematical Ideas & Techniques	Solve Problems	Use Technology

Metal and Engineering Training Package

SROORE004A Participate in Outdoor Activities

2	2	2	2	1	2	1
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SRO YAC 001A COMPLY WITH MARITIME RULES AND REGULATIONS

YAC Yachting (Ballasted yachts)

DESCRIPTION: This unit covers the knowledge and skills to determine the Rules and regulations applicable to a marine activity and to apply them in the context of that activity.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Determine relevant rules and regulations</p>	<p>a. Relevant International Regulations for the Prevention of Collision at Sea are accessed, where appropriate to the maritime activity</p> <p>b. Regulations applying to the use of Inland Waters are accessed, where appropriate to the activity</p> <p>c. Regulations applicable to a particular maritime activity, craft and location are determined</p> <p>d. Other relevant state/territory or local legislation governing the use of an area for specific activities are sourced</p>
<p>2. Comply with relevant rules and regulations with respect to a specific activity</p>	<p>a. Situations where Rules must be applied in order to avoid collisions are recognized and the correct application determined</p> <p>b. Minimum safety requirements for a specific activity, as specified by relevant legislation, are determined</p> <p>c. Compliance with all relevant rules and legislation whilst participating in an activity is demonstrated</p>

Range of Variables

COMPLY WITH MARITIME RULES AND REGULATIONS

VARIABLE STATEMENT	CATEGORIES
<p>1. Maritime activities</p>	<ul style="list-style-type: none"> a. windsurfing b. small boat sailing c. motor cruising d. yachting e. power boating f. sea kayaking g. recreational fishing h. charter boat operations
<p>2. Other relevant legislation</p>	<ul style="list-style-type: none"> a. state/territory Departments of Transport/Harbours and Marine b. state/territory Departments of Conservation (or equivalent) c. state/territory Departments of Fisheries/Primary Industries d. local port regulations e. road traffic regulations
<p>3. Rules for the Prevention of Collision at Sea</p>	<ul style="list-style-type: none"> a. responsibility (rule 2) b. basic definitions (rule 3) c. look-out (rule 5) d. safe speed (rule 6) e. risk of collision (rule 7) f. action to avoid collision (rule 8) g. narrow channel (rule 9) h. traffic separation schemes (rule 10) i. sailing vessels (rule 12) j. overtaking (rule 13) k. head-on situation (rule 14) l. crossing situation (rule 15) m. action by give-way vessel (rule 16) n. action by stand-on vessel (rule 17) o. responsibility between vessels (rule 18) p. restricted visibility (rule 19) q. lights, shapes, etc (rules 20-31) r. sound signals (rule 34) s. diving and underwater operations
<p>4. Safety Regulations</p>	<p>may specify use of/access to:</p> <ul style="list-style-type: none"> a. personal flotation devices, type1, 2 or 3) b. first aid kits c. engine spares d. distress flares e. radios f. harnesses g. Emergency Position Indicating Radio Beacon h. fire fighting equipment

COMPLY WITH MARITIME RULES AND REGULATIONS

<p>1. Critical aspects of evidence to be considered</p>	<ul style="list-style-type: none"> a. Assessment must confirm sufficient knowledge of legislation applicable to a specific activity conducted within the marine/aquatic environment b. Assessment of performance should be over a period of time covering all categories of each range of variable statements that are applicable to the type of craft and maritime activity in the learners environment c. In particular, assessment must confirm the ability to <ul style="list-style-type: none"> c.1 Comply with all relevant international, state/territory and local legislation applicable to the conduct of a particular activity c.2 Apply knowledge of the legislation to avoid collisions and maintain safety
<p>2. Interdependent assessment of units</p>	<ul style="list-style-type: none"> e. This unit must be assessed after attainment of competency in the following unit(s): <ul style="list-style-type: none"> a.3 Nil f. This unit must be assessed in conjunction with the following unit(s): <ul style="list-style-type: none"> b.5 Units specific to the particular outdoor activity e. For the purpose of integrated assessment, this unit may be assessed in conjunction with other units
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Underpinning knowledge <ul style="list-style-type: none"> a.1 International, state/territory and local legislation that impact upon particular activity or context a.2 Factors that affect application of international, state/territory and local legislation to specific locations, persons and situations b. Underpinning skills <ul style="list-style-type: none"> b.1 Ability to apply specific rules and legislation to particular activity/craft or location
<p>4. Resource implications</p>	<ul style="list-style-type: none"> a. Assessment of this competency requires access to relevant International, State/Territory and local legislation and a suitable location, craft and equipment to participate in a particular maritime activity b. Assessment of this competency will require human resources consistent with those outlined in the Assessment Guidelines
<p>5. Consistency in performance</p>	<ul style="list-style-type: none"> a. Competence in this unit must be assessed across a broad range of situations applicable to a particular activity to ensure consistency of performance over the range of variables and contexts
<p>6. Context for assessment</p>	<ul style="list-style-type: none"> a. Competency must be demonstrated in a real maritime situation whilst participating in a particular maritime

Metal and Engineering Training Package

SROYAC001A Comply with Maritime Rules and Regulations

- activity
- b. In cases where the learner does not have the opportunity to cover all categories of each range of variables statement that are applicable to the type of craft and maritime activity in the work environment, the remainder should be assessed through realistic simulations, projects, previous relevant experience or oral questioning on “What if?” scenarios
 - c. Assessment of this unit of competence will usually include observation of processes and procedures, oral and/or written questioning on underpinning knowledge and skills and consideration of required attitudes
 - d. Where performance is not directly observed and/or is required to be demonstrated over a “period of time” and/or in a “number of locations”, any evidence should be authenticated by colleagues, supervisors, clients or other appropriate persons

KEY COMPETENCIES						
Collect, Analyse & Organise Information	Communicate Ideas & Information	Plan & Organise Activities	Work with Others & in Teams	Use Mathematical Ideas & Techniques	Solve Problems	Use Technology
2	-	1	-	-	-	-

SRO YAC 002A

CREW A BALLASTED YACHT INSHORE

YAC

Yachting (Ballasted yachts)

DESCRIPTION: This unit covers the knowledge and skills to become an effective member of the crew on board a ballasted yacht sailing on short passages within sheltered waters with reasonable access to safe anchorages.

ELEMENT	PERFORMANCE CRITERIA
<p>3. Handle rope safely</p>	<p>a. Potential dangers from unsafe practices when handling ropes are identified and strategies are implemented to ensure safety of self and others</p> <p>b. Ropes are correctly coiled, stowed and secured to cleats and single and double bollards</p> <p>c. The advantages, disadvantages of different knots are determined and use appropriate to the situation is demonstrated</p>
<p>4. Use correct nautical terminology</p>	<p>a. The safety considerations related to the use of correct terminology on board a sailing vessel are identified</p> <p>b. Correct nautical terms for the craft, rigging, sails, process of sailing and all equipment are used to ensure accurate communication on board</p>
<p>5. Get under way and return to berth</p>	<p>a. Potential dangers associated with unsafe practices when getting under way and returning to berth are identified and minimised through adequate precautions and practices</p> <p>b. Specific tasks associated with getting under way and berthing when using different types of berth are identified and demonstrated</p>
<p>6. Set and handle sails</p>	<p>f. Sails appropriate to the situation are selected and, where appropriate, reefing of sails is performed in accordance with existing conditions and requirements</p> <p>g. A mainsail and headsail are correctly set and lowered according to standard procedures</p> <p>h. Correct and timely communication with other crew ensures efficient operations with respect to hoisting, setting and lowering</p> <p>i. Procedures when hoisting, setting and lowering sails indicate an understanding of the purpose of running rigging to associated components</p> <p>j. Strategies are developed and implemented to minimise potential dangers to crew and equipment from incorrect handling of sails and rigging</p>
<p>7. Apply sailing theory</p>	<p>d. Differences between true and apparent wind, and its affect on sailing and steering, are identified and applied when trimming sails</p> <p>e. Knowledge of the points of sailing and how sails work in each situation with reference to wind direction are applied to trim sails to achieve the desired sailing effect</p> <p>f. Crewing techniques are correctly applied to achieve the various points of sailing efficiently and with appropriate timing with respect to the craft's direction</p> <p>g. An accurate compass course is maintained, under sail and engine power</p>
<p>8. Sail in a safe and courteous manner</p>	<p>a. Safe sailing practices and etiquette are applied when sailing, mooring and interacting with others sailors</p> <p>b. Nautical regulations with respect to efficient lookouts and Collision are applied</p>

	<ul style="list-style-type: none">c. National, State and local legislation with respect to the safety equipment required on board and safety drills is complied with and safety equipment is used and maintained in accordance with regulations and manufacturer's recommendationsd. Fire hazards on board are identified and fire prevention strategies implementede. Recovery drill procedures are correctly applied in 'person' overboard situationsf. Knowledge of weather forecasts and wind observations is used to determine prevailing and future sailing conditionsg. Adequate levels of personal fitness are maintained in order to sail in the prevailing conditionsh. Specific boat handling requirements of crew on sailing vessels are identified and the tasks at each area performedi. Differences between crew organisation on different size vessels, and consequent task allocation, are identified and applied to handling a vessel as part of a team approach
<p>9. Operate auxiliary engines and craft</p>	<ul style="list-style-type: none">a. Pre-start and stop checks of craft's engine are conducted in accordance with operating procedures and manufacturer's guidelinesb. Starting and stopping procedures are performed in accordance with operating procedures and manufacturer's guidelinesc. Correct use of main engine controls is demonstrated to ensure adequate control of craftd. Strategies to minimise the risk of ropes fouling with the propeller are implementede. Dangers associated with the incorrect use of marine heads are identified and correct procedures are demonstrated for the open up/shut down of a marine headf. A dinghy is correctly used as a yacht tender, demonstrating safe handling during launching, boarding, loading, rowing, use of outboard and recovery

Range of Variables

CREW A BALLASTED YACHT INSHORE

VARIABLE STATEMENT	CATEGORIES
<p>1. Associated components when hoisting, setting and lowering sails</p>	<p>includes</p> <ul style="list-style-type: none"> a. halyards b. sheets c. reeflines d. blocks e. cleats f. outhauls g. downhauls h. vang i. backstays
<p>9. Berths</p>	<ul style="list-style-type: none"> a. along side mooring b. pens c. mooring buoys d. anchors
<p>10. Boat handling requirements</p>	<ul style="list-style-type: none"> l. at the helm m. cockpit n. amidships o. foredeck
<p>11. Engine controls</p>	<ul style="list-style-type: none"> a. gear lever b. throttle c. on/off control
<p>12. Inshore</p>	<ul style="list-style-type: none"> a. within sheltered waters (smooth or partially smooth) with reasonable access to safe anchorages
<p>13. Knots</p>	<ul style="list-style-type: none"> a. figure of eight b. clove hitch c. rolling hitch d. bowline e. round turn and two half hitches
<p>14. Nautical regulations</p>	<ul style="list-style-type: none"> a. efficient lookout at sea b. collision regulations including <ul style="list-style-type: none"> b.1 port and starboard b.2 overtaking vessels b.3 windward/leeward b.4 keeping to the right in channels b.5 sail and power meeting b.6 signifying intentions in plenty of time
<p>15. Nautical terminology</p>	<ul style="list-style-type: none"> i. sailing process (eg, port, starboard, ahead, astern, windward, leeward, abeam, forward, aft)

Metal and Engineering Training Package

SROYAC002A Crew a Ballasted Yacht Inshore

	<ul style="list-style-type: none">j. hullk. rigl. sailsm. personal equipmentn. safety equipment
16. Points of sailing	<ul style="list-style-type: none">a. runningb. reachingc. close hauledd. 'no go' zonee. tackingf. gybingg. heaving to
17. Pre-start/stop checks	<ul style="list-style-type: none">a. fuelb. oilc. cooling systemd. electronics
18. Recovery drill procedures	apply to <ul style="list-style-type: none">a. helicopter rescueb. 'quick stop'c. lifesling
19. Safety equipment	<ul style="list-style-type: none">a. personal buoyancy aidsb. harnessesc. fire fighting equipmentd. distress flarese. Emergency Position Indicating Radio Beacon
20. Sailing practices and etiquette	apply to <ul style="list-style-type: none">a. laying anchorb. mooring alongsidec. berthingd. leaving and returning to berths and mooringse. unnecessary noisef. speed observationsg. flag etiquetteh. environmental impact
21. Standard procedures for setting and de-rigging sails	<ul style="list-style-type: none">n. bending ono. hoistingp. trimmingq. reefingr. lowerings. furlingt. packing

CREW A BALLASTED YACHT INSHORE

13. Critical aspects of evidence to be considered

- a. Assessment must confirm sufficient knowledge of safety practices and procedures on board yachts
- b. Assessment of performance should be over a period of time covering all categories of each range of variables statement that are applicable in the learners environment
- c. In particular, assessment must confirm the ability to
 - c.1 Act as an effective crew member as part of a team to sail a yacht within sheltered waters (smooth or partially smooth waters) with reasonable access to safe anchorages
 - c.2 Apply knowledge of sailing theory and practice to set and trim sails to achieve the various points of sailing when required
 - c.3 Perform all aspects of crew work

14. Interdependent assessment of units

- a. This unit must be assessed after attainment of competency in the following:
 - a.1 Handling of small power boats (unit of competency to be developed in Maritime and/or Seafood Training Packages)
- b. This unit must be assessed in conjunction with the following unit(s):
 - b.1 SRO YAC 001A Comply with maritime rules and regulations
 - b.2 SRO ORE 001A Prepare to participate in a supervised outdoor activity requiring basic skills
 - b.3 SRO ORE 002A Participate in a supervised outdoor activity requiring basic skills
 - b.4 SRO OPS 006A Use and maintain a temporary or overnight site
 - b.5 SRO OPS 001A Implement minimal environmental impact practices
- c. For the purpose of integrated assessment, this unit may be assessed in conjunction with the following unit(s):
 - c.1 SRO OPS 003A Apply weather information
 - c.2 Relevant units from the Maritime Training Package

15. Required knowledge and skills

- b. Underpinning knowledge
 - a.1 Nautical terms as applied to sailing
 - a.2 Nautical regulations
 - a.3 Sailing practices and etiquette with respect to mooring, flag etiquette, speed observation, environmental impact
 - a.4 Regulations with respect to carrying and use of safety equipment
 - a.5 Person overboard procedures
 - a.6 Sources of weather information and interpretation of forecasts
 - a.7 Wind indicators
 - a.8 Rope handling and knots (figure of eight, clove hitch, rolling hitch, bowline, round turn and two half hitches)
 - a.9 Operation of yacht engines
 - a.10 safe operation of a dinghy as a yacht tender
- c. Underpinning skills
 - b.1 Setting sails to achieve points of sail

<p>16. Resource implications</p>	<p>a. Assessment of this competency requires access to a yacht, other crew and sheltered waters with reasonable access to safe anchorages</p> <p>b. Assessment of this competency will require human resources consistent with those outlined in the Assessment Guidelines</p>
<p>17. Consistency in performance</p>	<p>a. Competence in this unit must be assessed over a period of time in order to ensure consistency of performance over the range of variables and contexts applicable to sailing a yacht in sheltered waters with reasonable access to safe anchorages and to cover all aspects of crew work</p>
<p>18. Context for assessment</p>	<p>g. Competency must be demonstrated whilst acting as crew on yachts cruising in sheltered waters with reasonable access to safe anchorages</p> <p>h. In cases where the learner does not have the opportunity to cover all categories of each range of variables statement in the work environment, the remainder should be assessed through realistic simulations, projects, previous relevant experience or oral questioning on “What if?” scenarios</p> <p>i. Assessment of this unit of competence will usually include observation of processes and procedures, oral and/or written questioning on underpinning knowledge and skills and consideration of required attitudes</p> <p>j. Where performance is not directly observed and/or is required to be demonstrated over a “period of time” and/or in a “number of locations”, any evidence should be authenticated by colleagues, supervisors, clients or other appropriate persons</p>

KEY COMPETENCIES						
Collect, Analyse & Organise Information	Communicate Ideas & Information	Plan & Organise Activities	Work with Others & in Teams	Use Mathematical Ideas & Techniques	Solve Problems	Use Technology
1	1	1	1	2	1	1

SRO YAC 003A

SKIPPER A BALLASTED YACHT INSHORE

YAC

Yachting (Ballasted yacht)

DESCRIPTION: This unit covers the knowledge and skills to skipper a ballasted yacht sailing on short passages within sheltered waters with reasonable access to safe anchorages.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Handle rope safely</p>	<ul style="list-style-type: none"> a. Strategies are implemented to ensure safety of self and others when using and handling ropes b. Measures are taken to ensure that ropes are correctly coiled, stowed and secured to cleats and single and double bollards c. Knowledge of the properties of synthetic ropes is used to determine the most appropriate rope for each on board situation d. Warps are handled correctly to ensure efficient mooring e. Safe and correct use of winches is demonstrated f. The advantages, disadvantages of different knots are determined and their use appropriate to the situation is demonstrated g. Splicing and whipping are used to conduct routine maintenance and repair work
<p>2. Plan and prepare for passage</p>	<ul style="list-style-type: none"> a. Yacht is prepared for passage with adequate supervision/checking of all relevant contextual issues b. A plan for crew action and delegation of responsibility in a variety of condition and situations is developed and implemented c. Knowledge of design and loading factors is applied to ensure the stability of the vessel and crew safety d. Gear is correctly secured and stowed on upper deck and below to minimise loss and/or water damage or injury whilst maintaining proper access within and on the vessel e. Strategies are implemented to ensure the security and safety of passengers and crew on deck and below when the yacht is underway f. A short passage, on tidal/estuary waters is planned, taking account of relevant navigational hazards and limitations imposed by the type of boat and the strength of the crew g. A victualling list is developed and victualling organisation is supervised for the passage h. Watches at sea and in harbour are organised and supervised
<p>3. Get under way and return to berth or mooring</p>	<ul style="list-style-type: none"> a. Potential dangers associated with unsafe practices when getting under way and returning to berth are identified and minimised through adequate precautions, practices and crew supervision b. Personal boat handling skills and effective and timely direction to crew enables the yacht to be safely brought to and from a mooring buoy under sail c. Personal boat handling skills and effective and timely direction to crew enables the yacht to be safely brought to and from an alongside berth, mooring buoy and anchor under power d. Specific tasks associated with getting under way and berthing when using different types of berth are identified and demonstrated e. Factors to be considered when accepting and being towed are identified and applied in these situations f. Under personal steerage, a tow is accepted and the yacht is maneuvered and steered whilst under tow

<p>4. Handle craft</p>	<ul style="list-style-type: none"> k. Knowledge of the effects and efficient use of centre of effort, lateral resistance and the keel or centreplate is used to assist in managing the yacht and reducing leeway l. Correct and timely communication with crew ensures efficient operations with respect to hoisting, setting and lowering sails m. Steering practices when supervising the hoisting, setting and lowering sails indicate an understanding of the points of sail and sail setting techniques n. Sails are changed appropriately to suit prevailing conditions o. Strategies are developed and implemented to minimise potential dangers to crew and equipment from incorrect handling of sails and rigging
<p>5. Sail in a safe and courteous manner</p>	<ul style="list-style-type: none"> a. Safe sailing practices and etiquette are applied when sailing, mooring and interacting with others sailors b. International Regulations for the Prevention of Collisions at Sea are applied by self and crew c. National, State and local legislation with respect to the safety equipment required on board and safety drills is complied with and safety equipment is stored, used and maintained in accordance with regulations and manufacturer's recommendations d. Fire hazards on board are identified, fire prevention strategies are implemented and fire fighting procedures are demonstrated e. Procedures are followed to ensure that inexperienced crew or passengers are familiar with safety procedures and requirements f. Recovery drill procedures are correctly applied in 'person' overboard situations and correct action as helmsman is taken g. The correct use of distress flares and Emergency Position Indicating Radio Beacon is demonstrated and situations in which they may be used correctly detailed h. Correct procedures to be followed as skipper in the event of a helicopter rescue are outlined i. Knowledge of weather forecast interpretation and use of forecasting aids is used to determine future sailing conditions
<p>6. Navigate in sheltered waters with reasonable access to safe anchorages</p>	<ul style="list-style-type: none"> a. Knowledge of navigation principles and techniques is applied to carry out routine navigational duties and prepare navigational plans b. The IALA system of buoyage and other visual aids to navigation are correctly interpreted c. Accurate position fixing is demonstrated, taking into account variables and sources of inaccuracies d. Techniques to apply in restricted visibility are identified and applied, where relevant
<p>7. Operate and maintain inboard engine</p>	<ul style="list-style-type: none"> a. Complete engine pre start checks and shut down procedures are conducted in accordance with operating procedures and manufacturer's guidelines b. The engine is started, stopped and operated with correct use of controls c. Serviceable engine parts are identified and located

Range of Variables

SKIPPER A BALLASTED YACHT INSHORE

VARIABLE STATEMENT	CATEGORIES
1. Berths	<ul style="list-style-type: none"> a. along side docks and jetties b. pens c. mooring buoys d. anchors
2. Contextual issues for preparation	<ul style="list-style-type: none"> a. selection of crew b. crew abilities c. consideration of weather, tides and winds d. selection of sails e. engine checks f. food and water requirements g. safety equipment
3. Design and loading factors	<ul style="list-style-type: none"> u. simple static and dynamic stability v. limit of positive stability w. proper stowage and security of loose or moveable items x. maintenance of proper access within and on the vessel y. security, safety and comfort of passengers and crew
4. Factors when accepting and being towed	<ul style="list-style-type: none"> a. passing tow ropes b. use of bridles c. securing tow ropes, suitable knots and strong points d. taking the strain e. towing alongside or astern f. communication between craft g. casting off h. manoeuvring while towing and undertow
5. Fire hazards	<ul style="list-style-type: none"> a. fixed fuel tanks b. cooling appliances c. freezers d. complex electrical systems e. inboard engine installations
6. Inshore	<ul style="list-style-type: none"> a. within sheltered waters (smooth or partially smooth) with reasonable access to safe anchorages
7. Knots	<ul style="list-style-type: none"> a. figure of eight b. clove hitch c. rolling hitch d. reef knot e. bowline f. single and double sheet bend

	g. round turn and two half hitches
8. Recovery drill procedures	apply to: p. helicopter rescue q. 'quick stop' r. lifesling
9. Routine navigational duties	a. taking and plotting fixes b. estimation of tidal heights and fixes c. course calculations to allow for tidal stream, leeway and drift d. maintenance of navigational records e. use of echo sounder and lead line
10. Safety equipment	a. personal buoyancy aids b. harnesses c. fire fighting equipment d. distress flares e. Emergency Position Indicating Radio Beacon
11. Sailing practices and courtesies	apply to: a. laying anchor b. mooring alongside c. berthing d. leaving and returning to berths and moorings e. unnecessary noise f. speed observations g. flag etiquette h. environmental impact
12. Splicing and whipping	o. eye splice p. common whipping q. sail-makers whipping
13. Variety of conditions and situations	a. berthing and unberthing b. anchoring c. reduced visibility d. adverse weather conditions e. emergency conditions f. persons overboard situations g. victualling

SKIPPER A BALLASTED YACHT INSHORE

1. Critical aspects of evidence to be considered

- q. Assessment must confirm sufficient knowledge of safety practices and supervision of crew practices and procedures on board yachts
- r. Assessment of performance should be over a period of time covering all categories of the range of variables statements that are applicable in the learners environment
- s. In particular, assessment must confirm the ability to
 - c.1. Apply knowledge of sailing theory and practice to direct crew to set and trim sails to achieve the various points of sailing when required
 - c.2. Act as a competent skipper on sheltered waters with reasonable access to safe anchorages, ensuring crew and, where relevant, passenger safety
 - c.3. Act as skipper or watch leader
 - c.4. Skipper a vessel on a minimum of two four-hour night passages
 - c.5. Skipper a vessel in a variety of weather conditions

2. Interdependent assessment of units

- a. This unit must be assessed after attainment of competency in the following unit(s):
 Handling a small power boat (unit of competency to be developed in Maritime and/or Seafood Training Packages)
 SRO YAC 002A Crew a ballasted yacht inshore
 SRO ORE 001A Prepare to participate in a supervised outdoor activity requiring basic skills
 SRO ORE 002A Participate in a supervised outdoor activity requiring basic skills
 SRO OPS 006A Use and maintain a temporary or overnight site
 SRO OPS 001A Implement minimal environmental impact practices
- b. This unit must be assessed in conjunction with the following unit(s):
 - b.1 SRO ORE 003A Prepare to participate in outdoor activities
 - b.2 SRO ORE 004A Participate in outdoor activities
 - b.3 SRO ORE 002A Plan for minimal environmental impact
 - b.4 SRO OPS 003A Apply weather information
 - b.5 SRO YAC 001A Comply with maritime rules and regulations
 - b.6 SRO NAV 001A Navigate in tracked or easy untracked areas (or equivalent units from the Maritime Training Package)
 - b.7 PUA OPEO 04A Operate Communications systems
- c. For the purpose of integrated assessment, this unit may be assessed in conjunction with the following unit(s):
 - c.3 SRO OPS 005A Apply search and rescue skills
 - c.4 Units from the Maritime Training Package

<p>3. Required knowledge and skills</p>	<p>a. Underpinning knowledge</p> <ul style="list-style-type: none"> a.1 Nautical terms as applied to sailing a.2 Nautical regulations a.3 Sailing practices and etiquette a.4 Regulations with respect to carrying and use of safety equipment a.5 Person overboard procedures a.6 Sources of weather information and interpretation of forecasts a.7 Properties of synthetic ropes (including strength, construction, care and maintenance, limitations and common usage) a.8 Rope handling, knots and splicing a.9 Different types of anchor and anchoring techniques and considerations a.10 Navigational charts and publications a.11 Use of navigational instruments and charts a.12 Factors affecting navigation accuracy a.13 IALA system of buoyage a.14 Navigation in restricted visibility a.15 Tides and currents and the ability to use this information a.16 Customs relating to common signals used at sea, including international code of signals, alphabetical flags and numeral pennants <p>b. Underpinning skills</p> <ul style="list-style-type: none"> b.1 Setting sails and steering boat to achieve points of sail b.2 Inshore navigation
<p>4. Resource implications</p>	<p>a. Assessment of this competency requires access to a yacht, other crew and sheltered waters with reasonable access to safe anchorages</p> <p>b. Assessment of this competency will require human resources consistent with those outlined in the Assessment Guidelines</p>
<p>5. Consistency in performance</p>	<p>a. Competence in this unit must be assessed over a period of time in order to ensure consistency of performance over the range of variables and contexts applicable to sailing a yacht on sheltered waters with reasonable access to safe anchorages</p>
<p>6. Context for assessment</p>	<p>a. Competency must be demonstrated whilst acting as a skipper on yachts cruising on sheltered waters with reasonable access to safe anchorages</p> <p>b. In cases where the learner does not have the opportunity to cover all categories of the range of variables statements in the work environment, the remainder should be assessed through realistic simulations, projects, previous relevant experience or oral questioning on “What if?” scenarios</p> <p>c. Assessment of this unit of competence will usually include observation of processes and procedures, oral and/or written questioning on underpinning knowledge and skills and consideration of required attitudes</p> <p>d. Where performance is not directly observed and/or is required to be demonstrated over a “period of time” and/or in a “number of locations”, any evidence should be authenticated by colleagues, supervisors, clients or other appropriate persons</p>

Metal and Engineering Training Package

SROYAC003A Skipper a Ballasted Yacht Inshore

KEY COMPETENCIES						
Collect, Analyse & Organise Information	Communicate Ideas & Information	Plan & Organise Activities	Work with Others & in Teams	Use Mathematical Ideas & Techniques	Solve Problems	Use Technology
2	2	2	2	2	2	2

SRO YMC 001A CREW A MOTOR CRUISER INSHORE

YMC Yachting (Motor cruiser)

DESCRIPTION: This unit covers the knowledge and skills to become an effective member of the crew on board a motor cruising yacht sailing on short passages within sheltered waters with reasonable access to safe anchorages.

ELEMENT	PERFORMANCE CRITERIA
10. Handle rope safely	<ul style="list-style-type: none"> d. Potential dangers from unsafe practices when handling ropes are identified and strategies are implemented to ensure safety of self and others e. Ropes are correctly coiled, stowed and secured to cleats and single and double bollards f. The advantages, disadvantages of different knots are determined and use appropriate to the situation is demonstrated
11. Use correct nautical terminology	<ul style="list-style-type: none"> c. The safety considerations related to the use of correct terminology on board a vessel are identified d. Correct nautical terms for the craft and all equipment are used to ensure accurate communication on board
12. Get under way and return to berth	<ul style="list-style-type: none"> c. Potential dangers associated with unsafe practices when getting under way and returning to berth are identified and minimised through adequate precautions and practices d. Specific tasks associated with getting under way and berthing when using different types of berth are identified and demonstrated
13. Travel in a safe and courteous manner	<ul style="list-style-type: none"> j. Safe practices and etiquette are applied when motoring, mooring and interacting with others sailors k. Nautical regulations with respect to efficient lookouts and Collision are applied l. National, State and local legislation with respect to the safety equipment required on board and safety drills is complied with and safety equipment is used and maintained in accordance with regulations and manufacturer's recommendations m. Fire hazards on board are identified and fire prevention strategies implemented n. Recovery drill procedures are correctly applied in 'person' overboard situations o. Knowledge of weather forecasts and wind observations is used to determine prevailing and future conditions p. An accurate compass course is maintained, under engine power q. Specific boat handling requirements of crew on vessels are identified and the tasks at each area performed r. Differences between crew organisation on different size vessels, and consequent task allocation, are identified and applied to handling a vessel as part of a team approach
14. Operate auxiliary engines and craft	<ul style="list-style-type: none"> g. Pre-start and stop checks of craft's engine are conducted in accordance with operating procedures and manufacturer's guidelines h. Starting and stopping procedures are performed in accordance with operating procedures and manufacturer's guidelines i. Correct use of main engine controls is demonstrated to ensure adequate control of craft j. Strategies to minimise the risk of ropes fouling with the propeller are implemented k. Dangers associated with the incorrect use of marine heads are

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SROYMC001A Crew a Motor Cruiser Inshore

- identified and correct procedures are demonstrated for the open up/shut down of a marine head
- I. A dinghy is correctly used as a yacht tender, demonstrating safe handling during launching, boarding, loading, rowing, use of outboard and recovery

Range of Variables

CREW A MOTOR CRUISER INSHORE

VARIABLE STATEMENT	CATEGORIES
1. Berths	<ul style="list-style-type: none"> e. along side mooring f. pens g. mooring buoys h. anchors
22. Boat handling requirements	<ul style="list-style-type: none"> s. at the helm t. cockpit u. amidships v. foredeck
23. Engine controls	<ul style="list-style-type: none"> d. gear lever e. throttle f. on/off control
24. Inshore	<ul style="list-style-type: none"> b. within sheltered waters (smooth or partially smooth) with reasonable access to safe anchorages
25. Knots	<ul style="list-style-type: none"> f. figure of eight g. clove hitch h. rolling hitch i. bowline j. round turn and two half hitches
26. Nautical regulations	<ul style="list-style-type: none"> c. efficient lookout at sea d. collision regulations including <ul style="list-style-type: none"> b.7 port and starboard b.8 overtaking vessels b.9 windward/leeward b.10 keeping to the right in channels b.11 sail and power meeting b.12 signifying intentions in plenty of time
27. Nautical terminology	<ul style="list-style-type: none"> r. direction (eg, port, starboard, ahead, astern, windward, leeward, abeam, forward, aft) s. hull t. personal equipment u. safety equipment
28. Pre-start/stop checks	<ul style="list-style-type: none"> e. fuel f. oil g. cooling system h. electronics
29. Recovery drill procedures	<ul style="list-style-type: none"> d. helicopter rescue e. 'quick stop'

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SROYMC001A Crew a Motor Cruiser Inshore

	f. lifesling
30. Safety equipment	f. personal buoyancy aids g. harnesses h. fire fighting equipment i. distress flares j. Emergency Position Indicating Radio Beacon
31. Sailing practices and etiquette	i. laying anchor j. mooring alongside k. berthing l. leaving and returning to berths and moorings m. unnecessary noise n. speed observations o. flag etiquette p. environmental impact

CREW A MOTOR CRUISER INSHORE

<p>19. Critical aspects of evidence to be considered</p>	<ul style="list-style-type: none"> d. Assessment must confirm sufficient knowledge of safety practices and procedures on board vessels e. Assessment of performance should be over a period of time covering all categories of each range of variables statement that are applicable in the learners environment f. In particular, assessment must confirm the ability to <ul style="list-style-type: none"> c.4 Act as an effective crew member as part of a team to travel on a motor cruiser within sheltered waters (smooth or partially smooth waters) with reasonable access to safe anchorages c.5 Perform all aspects of crew work
<p>20. Interdependent assessment of units</p>	<ul style="list-style-type: none"> c. This unit must be assessed after attainment of competency in the following: <ul style="list-style-type: none"> a.2 Handling of small power boats (unit of competency to be developed in Maritime and/or Seafood Training Packages) d. This unit must be assessed in conjunction with the following unit(s): <ul style="list-style-type: none"> b.6 SRO YAC 001A Comply with maritime rules and regulations b.7 SRO ORE 001A Prepare to participate in a supervised outdoor activity requiring basic skills b.8 SRO ORE 002A Participate in a supervised outdoor activity requiring basic skills b.9 SRO OPS 006A Use and maintain a temporary or overnight site b.10 SRO OPS 001A Implement minimal environmental impact practices d. For the purpose of integrated assessment, this unit may be assessed in conjunction with the following unit(s): <ul style="list-style-type: none"> c.3 SRO OPS 003A Apply weather information c.4 Relevant units from the Maritime Training Package
<p>21. Required knowledge and skills</p>	<ul style="list-style-type: none"> d. Underpinning knowledge <ul style="list-style-type: none"> a.11 Nautical terms a.12 Nautical regulations a.13 Practices and etiquette with respect to mooring, flag etiquette, speed observation, environmental impact a.14 Regulations with respect to carrying and use of safety equipment a.15 Person overboard procedures a.16 Sources of weather information and interpretation of forecasts a.17 Wind indicators a.18 Rope handling and knots (figure of eight, clove hitch, rolling hitch, bowline, round turn and two half hitches) a.19 Operation of motor cruiser engines a.20 Safe operation of a dinghy as a tender e. Underpinning skills <ul style="list-style-type: none"> b.2 Ability to work and communicate as part of a team
<p>22. Resource implications</p>	<ul style="list-style-type: none"> c. Assessment of this competency requires access to a cruising yacht, other crew and sheltered waters with reasonable access to safe

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SROYMC001A Crew a Motor Cruiser Inshore

	<p>anchorages</p> <p>d. Assessment of this competency will require human resources consistent with those outlined in the Assessment Guidelines</p>
23. Consistency in performance	<p>b. Competence in this unit must be assessed over a period of time in order to ensure consistency of performance over the range of variables and contexts applicable to cruising in sheltered waters with reasonable access to safe anchorages and to cover all aspects of crew work</p>
24. Context for assessment	<p>k. Competency must be demonstrated whilst acting as crew cruising in sheltered waters with reasonable access to safe anchorages</p> <p>l. In cases where the learner does not have the opportunity to cover all categories of each range of variables statement in the work environment, the remainder should be assessed through realistic simulations, projects, previous relevant experience or oral questioning on “What if?” scenarios</p> <p>m. Assessment of this unit of competence will usually include observation of processes and procedures, oral and/or written questioning on underpinning knowledge and skills and consideration of required attitudes</p> <p>n. Where performance is not directly observed and/or is required to be demonstrated over a “period of time” and/or in a “number of locations”, any evidence should be authenticated by colleagues, supervisors, clients or other appropriate persons</p>

KEY COMPETENCIES						
Collect, Analyse & Organise Information	Communicate Ideas & Information	Plan & Organise Activities	Work with Others & in Teams	Use Mathematical Ideas & Techniques	Solve Problems	Use Technology
1	1	1	1	2	1	1

SRO YMC 002A SKIPPER A MOTOR CRUISER INSHORE

YMC Yachting (Motor cruising)

DESCRIPTION: This unit covers the knowledge and skills to skipper a motor yacht cruising on short passages within sheltered waters with reasonable access to safe anchorages.

ELEMENT	PERFORMANCE CRITERIA
8. Handle rope safely	<ul style="list-style-type: none"> h. Strategies are implemented to ensure safety of self and others when using and handling ropes i. Measures are taken to ensure that ropes are correctly coiled, stowed and secured to cleats and single and double bollards j. Knowledge of the properties of synthetic ropes is used to determine the most appropriate rope for each on board situation k. Warps are handled correctly to ensure efficient mooring l. Safe and correct use of winches is demonstrated m. The advantages, disadvantages of different knots are determined and their use appropriate to the situation is demonstrated n. Splicing and whipping are used to conduct routine maintenance and repair work
9. Plan and prepare for passage	<ul style="list-style-type: none"> i. Yacht is prepared for passage with adequate supervision/checking of all relevant contextual issues j. A plan for crew action and delegation of responsibility in a variety of condition and situations is developed and implemented k. Knowledge of design and loading factors is applied to ensure the stability of the vessel and crew safety l. Gear is correctly secured and stowed on upper deck and below to minimise loss and/or water damage or injury whilst maintaining proper access within and on the vessel m. Strategies are implemented to ensure the security and safety of passengers and crew on deck and below when the vessel is underway n. A short passage, on tidal/estuary waters is planned, taking account of relevant navigational hazards and limitations imposed by the type of boat and the strength of the crew o. A victualling list is developed and victualling organisation is supervised for the passage p. Watches at sea and in harbour are organised and supervised
10. Get under way and return to berth or mooring	<ul style="list-style-type: none"> g. Potential dangers associated with unsafe practices when getting under way and returning to berth are identified and minimised through adequate precautions, practices and crew supervision h. Personal boat handling skills and effective and timely direction to crew enables the vessel to be safely brought to and from an alongside berth, mooring buoy and anchor under power i. Specific tasks associated with getting under way and berthing when using different types of berth are identified and demonstrated j. Factors to be considered when accepting and being towed are identified and applied in these situations k. Under personal steerage, a tow is accepted and the vessel is maneuvered and steered whilst under tow
11. Handle craft	<ul style="list-style-type: none"> p. Knowledge of the effects and efficient use of centre of effort, lateral resistance and the keel or centreplate is used to assist in managing the yacht and reducing leeway

<p>12. Sail in a safe and courteous manner</p>	<ul style="list-style-type: none"> j. Safe sailing practices and etiquette are applied when motoring, mooring and interacting with others sailors k. International Regulations for the Prevention of Collisions at Sea are applied by self and crew l. National, State and local legislation with respect to the safety equipment required on board and safety drills is complied with and safety equipment is stored, used and maintained in accordance with regulations and manufacturer's recommendations m. Fire hazards on board are identified, fire prevention strategies are implemented and fire fighting procedures are demonstrated n. Procedures are followed to ensure that inexperienced crew or passengers are familiar with safety procedures and requirements o. Recovery drill procedures are correctly applied in 'person' overboard situations and correct action as helmsman is taken p. The correct use of distress flares and Emergency Position Indicating Radio Beacon (EPIRB) is demonstrated and situations in which they may be used correctly detailed q. Correct procedures to be followed as skipper in the event of a helicopter rescue are outlined r. Knowledge of weather forecast interpretation and use of forecasting aids is used to determine future conditions
<p>13. Navigate in sheltered waters with reasonable access to safe anchorages</p>	<ul style="list-style-type: none"> e. Knowledge of navigation principles and techniques is applied to carry out routine navigational duties and prepare navigational plans f. The IALA system of buoyage and other visual aids to navigation are correctly interpreted g. Accurate position fixing is demonstrated, taking into account variables and sources of inaccuracies h. Techniques to apply in restricted visibility are identified and applied, where relevant
<p>14. Operate and maintain inboard engine</p>	<ul style="list-style-type: none"> d. Complete engine pre start checks and shut down procedures are conducted in accordance with operating procedures and manufacturer's guidelines e. The engine is started, stopped and operated with correct use of controls f. Serviceable engine parts are identified and located and periodic maintenance checks on engine and electrical installations are performed g. Sufficient engine and electrical tool kits and spares are carried on board and stowed correctly h. Fuel consumption at different speeds is known and sufficient fuel is carried for the planned passage

Range of Variables

SKIPPER A MOTOR CRUISER INSHORE

VARIABLE STATEMENT	CATEGORIES
2. Berths	<ul style="list-style-type: none"> e. along side docks and jetties f. pens g. mooring buoys h. anchors
14. Contextual issues for preparation	<ul style="list-style-type: none"> h. selection of crew i. crew abilities j. consideration of weather, tides and winds k. engine checks l. food and water requirements m. safety equipment
15. Design and loading factors	<ul style="list-style-type: none"> z. simple static and dynamic stability aa. limit of positive stability bb. proper stowage and security of loose or moveable items cc. maintenance of proper access within and on the vessel dd. security, safety and comfort of passengers and crew
16. Factors when accepting and being towed	<ul style="list-style-type: none"> i. passing tow ropes j. use of bridles k. securing tow ropes, suitable knots and strong points l. taking the strain m. towing alongside or astern n. communication between craft o. casting off p. manoeuvring while towing and undertow
17. Fire hazards	<ul style="list-style-type: none"> f. fixed fuel tanks g. cooling appliances h. freezers i. complex electrical systems j. inboard engine installations
18. Inshore	<ul style="list-style-type: none"> b. within sheltered waters (smooth or partially smooth) with reasonable access to safe anchorages
19. Knots	<ul style="list-style-type: none"> h. figure of eight i. clove hitch j. rolling hitch k. reef knot l. bowline m. single and double sheet bend n. round turn and two half hitches

Metal and Engineering Training Package

SROYMC002A Skipper a Motor Cruiser Inshore

20. Recovery drill procedures	apply to w. helicopter rescue x. 'quick stop' y. lifesling
21. Routine navigational duties	f. taking and plotting fixes g. estimation of tidal heights and fixes h. course calculations to allow for tidal stream, leeway and drift i. maintenance of navigational records j. use of echo sounder and lead line
22. Safety equipment	f. personal buoyancy aids g. harnesses h. fire fighting equipment i. distress flares j. Emergency Position Indicating Radio Beacon
23. Sailing practices and courtesies	apply to i. laying anchor j. mooring alongside k. berthing l. leaving and returning to berths and moorings m. unnecessary noise n. speed observations o. flag etiquette p. environmental impact
24. Splicing and whipping	v. eye splice w. common whipping x. sail-makers whipping
25. Variety of conditions and situations	h. berthing and unberthing i. anchoring j. reduced visibility k. adverse weather conditions l. emergency conditions m. persons overboard situations n. victualling

SKIPPER A MOTOR CRUISER INSHORE

7. Critical aspects of evidence to be considered

- t. Assessment must confirm sufficient knowledge of safety practices and supervision of crew practices and procedures on board motor cruisers
- u. Assessment of performance should be over a period of time covering all categories of the range of variables statements that are applicable in the learners environment
- v. In particular, assessment must confirm the ability to
 - c.6. Act as a competent skipper on sheltered waters with reasonable access to safe anchorages, ensuring crew and, where relevant, passenger safety
 - c.7. Act as skipper or watch leader
 - c.8. Skipper a motor cruiser on a minimum of two four-hour night passages
 - c.9. Skipper a motor cruiser in a variety of weather conditions

8. Interdependent assessment of units

- c. This unit must be assessed after attainment of competency in the following unit(s):
 Handling a small power boat (unit of competency to be developed in Maritime and/or Seafood Training Packages)
 SRO YMC 001A Crew a motor cruiser inshore
 SRO ORE 001A Prepare to participate in a supervised outdoor activity requiring basic skills
 SRO ORE 002A Participate in a supervised outdoor activity requiring basic skills
 SRO OPS 006A Use and maintain a temporary or overnight site
 SRO OPS 001A Implement minimal environmental impact practices
- d. This unit must be assessed in conjunction with the following unit(s):
 - b.8 SRO ORE 003A Prepare to participate in outdoor activities
 - b.9 SRO ORE 004A Participate in outdoor activities
 - b.10 SRO ORE 002A Plan for minimal environmental impact
 - b.11 SRO OPS 003A Apply weather information
 - b.12 SRO YAC 001A Comply with maritime rules and regulations
 - b.13 SRO NAV 001A Navigate in tracked or easy untracked areas (or equivalent units from the Maritime Training Package)
 - b.14 PUA OPEO 04A Operate Communications systems
- d. For the purpose of integrated assessment, this unit may be assessed in conjunction with the following unit(s):
 - c.5 SRO OPS 005A Apply search and rescue skills
 - c.6 Units from the Maritime Training Package

9. Required

- c. Underpinning knowledge
 - a.17 Nautical terms

<p>knowledge and skills</p>	<ul style="list-style-type: none"> a.18 Nautical regulations a.19 Practices and etiquette a.20 Regulations with respect to carrying and use of safety equipment a.21 Person overboard procedures a.22 Sources of weather information and interpretation of forecasts a.23 Properties of synthetic ropes (including strength, construction, care and maintenance, limitations and common usage) a.24 Rope handling, knots and splicing a.25 Different types of anchor and anchoring techniques and considerations a.26 Navigational charts and publications a.27 Use of navigational instruments and charts a.28 Factors affecting navigation accuracy a.29 IALA system of buoyage a.30 Navigation in restricted visibility a.31 Tides and currents and the ability to use this information a.32 Customs relating to common signals used at sea, including International Code of signals, alphabetical flags and numeral pennants <ul style="list-style-type: none"> d. Underpinning skills <ul style="list-style-type: none"> b.3 Inshore navigation
<p>10. Resource implications</p>	<ul style="list-style-type: none"> c. Assessment of this competency requires access to a yacht, other crew and sheltered waters with reasonable access to safe anchorages d. Assessment of this competency will require human resources consistent with those outlined in the Assessment Guidelines
<p>11. Consistency in performance</p>	<ul style="list-style-type: none"> b. Competence in this unit must be assessed over a period of time in order to ensure consistency of performance over the range of variables and contexts applicable to operating a motor cruiser on sheltered waters with reasonable access to safe anchorages
<p>12. Context for assessment</p>	<ul style="list-style-type: none"> e. Competency must be demonstrated whilst acting as a skipper on vessels cruising on sheltered waters with reasonable access to safe anchorages f. In cases where the learner does not have the opportunity to cover all categories of the range of variables statements in the work environment, the remainder should be assessed through realistic simulations, projects, previous relevant experience or oral questioning on “What if?” Scenarios g. Assessment of this unit of competence will usually include observation of processes and procedures, oral and/or written questioning on underpinning knowledge and skills and consideration of required attitudes h. Where performance is not directly observed and/or is required to be demonstrated over a “period of time” and/or in a “number of locations”, any evidence should be authenticated by colleagues, supervisors, clients or other appropriate persons

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SROYMC002A Skipper a Motor Cruiser Inshore

KEY COMPETENCIES						
Collect, Analyse & Organise Information	Communicate Ideas & Information	Plan & Organise Activities	Work with Others & in Teams	Use Mathematical Ideas & Techniques	Solve Problems	Use Technology
2	2	2	2	2	2	2

SRO YSB 001A

USE BASIC SKILLS TO SAIL A SMALL BOAT IN CONTROLLED CONDITIONS

YSB

Yachting (Small boat)

DESCRIPTION: This unit deals with the knowledge and skills to rig and sail a small boat on a marked course in controlled conditions, under supervision.

ELEMENT	PERFORMANCE CRITERIA
<p>15. Select equipment and prepare for participation</p>	<ul style="list-style-type: none"> a. Information on weather and wind conditions is sourced to enable selection of a location to suit personal skill level b. Clothing suitable for the prevailing and expected conditions is selected c. Risks associated with the sailing environment are identified and strategies are implemented to reduce risks d. Safety equipment is worn/used in accordance with state/territory legislation and weather and light conditions e. Collision and water traffic regulations relevant to the activity area are identified and other safety signals, such as code flags, are recognised
<p>16. Rig and de-rig a small boat</p>	<ul style="list-style-type: none"> q. Correct terminology is used to identify the main parts of a small boat r. Sails, and their component parts, are correctly identified s. Fittings on mast, and boom are correctly identified and sails are correctly rigged using appropriate knots, under supervision
<p>17. Leave and return to beach/launching facility</p>	<ul style="list-style-type: none"> a. Wind direction is accurately determined to enable safe, easy launching and return b. The small boat is launched and landed efficiently in calm conditions whilst maintaining stability, correct direction and a controlled speed c. Correct position on the small boat is adopted and the centreboard and rudder are secured d. Centreboard and rudder are correctly prepared for return and raised on return
<p>18. Sail a marked course in calm conditions using basic skills</p>	<ul style="list-style-type: none"> a. Primary boat controls, and their effects on boat movement are recognised and correctly applied b. Common terminology with respect to the wind is identified and knowledge of wind, wind indicators and directional change in relation to wind is applied to determine the sailing directions, based on current wind direction c. Wind awareness, wind indicators and angle of the sail is used to slow and speed up the small boat using a basic heave to as a reference point d. Indicators identifying that the boat is being sailed close hauled are used to sail the boat to destination directly upwind/to windward e. The No-Go Zone perimeters are identified and the boat is tacked from close-hauled to close-hauled f. Indicators identifying that the boat is being sailed on a dead run are recognised and the mainsail is gybed while the boat remains sailing on a dead run g. Potential hazards when sailing downwind and gybing are identified and strategies to avoid the unexpected gybe are implemented h. Knowledge and awareness of wind direction relative to the boat, sail setting and a combination of techniques is used to manoeuvre a small boat through tacks and gybes where necessary to sail a small marked course which requires a range of points of sailing, including but not limited to close-hauled reaching and running, to complete the course

Metal and Engineering Training Package

SROYSB001A Use Basic Skills to Sail a Small Boat in Controlled Conditions

	<ul style="list-style-type: none">i. Compliance with all relevant collision and water traffic regulations is demonstrated and the boat is sailed within designated/defined areasj. Communication with other craft and with other crew members, where appropriate, is maintained.
6. Perform capsize drills	<ul style="list-style-type: none">a. Reasons for capsize are identifiedb. In a capsize situation, strategies to avoid injury are implementedc. Procedures in the event of a capsize are correctly implemented, including visual means of attracting attentiond. Adequate communication, correct technique and order of events is displayed to right a small boat, as part of a team
7. Participate in rescue and towing drills	<ul style="list-style-type: none">a. Reasons for towing a small boat are identified and boat is prepared for towing and handled safely under tow with instructor guidanceb. The small boat is released from tow under instructor guidancec. Under direct supervision and instructor guidance, a crew recovery drill is correctly implemented, demonstrating the procedures to be undertaken in the event of separation of a crew member from the craft
8. Handle small boat ashore	<ul style="list-style-type: none">a. Small boat is carried and stowed in accordance with supervisor's directionsb. Equipment is stowed or stored in accordance with manufacturer's recommendations and/or supervisor's directions

Range of Variables

USE BASIC SKILLS TO SAIL A SMALL BOAT IN CONTROLLED CONDITIONS

VARIABLE STATEMENT	CATEGORIES
1. Appropriate knots	<ul style="list-style-type: none"> w. figure of eight x. bowline y. half hitch z. reef knot aa. rolling hitch
2. Basic skills	<ul style="list-style-type: none"> a. tacking - turning bow through wind b. gybing - turning stern through wind c. basic heave to d. luffing of sails e. reaching f. sailing close hauled g. sailing on a run/running
3. Capsize procedures	<ul style="list-style-type: none"> a. stay with boat b. don't hang off boat c. crew weight on centreboard to right vessel d. "crew scoop" during righting of boat e. bailing out f. recovery of crew after righting of boat
4. Collision and water traffic regulations	<ul style="list-style-type: none"> a. turn right, pass port to port b. power gives way to sail c. right of way for commercial vessels
5. Controlled conditions	<ul style="list-style-type: none"> y. light winds (0-8 knots) z. sheltered waters (smooth or partially smooth waters, wave height to 0.3m)
6. Crew recovery procedures	<ul style="list-style-type: none"> a. maintain sight of crew overboard at all times b. teamwork c. approach and stop to leeward of crew member in water d. slow speed of approach e. assist crew on board
7. Equipment	<ul style="list-style-type: none"> a. wetsuits b. boots c. gloves d. spray jacket e. hats/caps f. Personal Flotation Devices (PFD) g. craft
8. Main parts of the small boat	<ul style="list-style-type: none"> a. hull b. gunwhale c. centreboard d. stern e. bow

Metal and Engineering Training Package

SROYSB001A Use Basic Skills to Sail a Small Boat in Controlled Conditions

	<ul style="list-style-type: none"> f. mast g. stays h. boom i. boom vang j. sails k. rudder l. tiller m. tiller extension
9. Primary boat controls	<ul style="list-style-type: none"> a. mainsail b. jib c. balance d. trim e. centreboard
10. Risks	<ul style="list-style-type: none"> z. sun burn aa. windburn bb. marine stingers cc. drowning dd. dehydration ee. hypothermia
11. Sails	<ul style="list-style-type: none"> bb. mainsail cc. jib dd. spinnaker
12. Small boat	<ul style="list-style-type: none"> a. small (18ft and under) unballasted mono or multi hulled vessel with one mast b. stayed or unstayed mast c. one, two or three sails d. one or more crew members
13. Speed controlled during launch/ return	<ul style="list-style-type: none"> by: ee. angle with respect to the wind ff. sails out gg. basic heave to
14. Towing procedures	<ul style="list-style-type: none"> a. single tow b. multiple tow c. pick-up of tow d. release from tow
15. Wind direction	<p>may be determined by:</p> <ul style="list-style-type: none"> a. flags b. smoke c. ripples on the water d. moored boats e. wind on the face
16. Wind terminology	<ul style="list-style-type: none"> a. wind aft b. upwind c. downwind d. wind abeam e. head to wind f. windward g. leeward

USE BASIC SKILLS TO SAIL A SMALL BOAT IN CONTROLLED CONDITIONS

25. Critical aspects of evidence to be considered

- a. Assessment must confirm sufficient knowledge of sailing theory and sailing conditions to perform basic manoeuvres
- b. Assessment of performance should be over a period of time covering one category of small boat and all categories of each range of variables statements that are applicable to the type of boat sailed and the learners environment
- c. In particular, assessment must confirm the ability to manoeuvre a small boat in calm conditions, demonstrating the ability to:
 - c.1 Prepare and launch the small boat
 - c.2 Sail a small course which includes a range of points of sailing including but not limited to close-hauled, reaching and running
 - c.3 Right a small boat
 - c.4 Participate in a crew recovery drill
 - c.5 Participate in a towing drill
 - c.6 Return the craft to shore/launching point safely
 - c.7 Apply knowledge to select equipment for personal use as well as to care for equipment appropriately

Note: Where learners sail in small boats with more than one crew member, ability to perform all roles required to sail the boat, eg, crewing and helming, must be demonstrated.

26. Interdependent assessment of units

- g. This unit must be assessed after attainment of competency in the following unit(s):
 - a.4 Nil
- b. This unit must be assessed in conjunction with the following unit(s):
 - b.6 SRO ORE 001A Prepare to participate in a supervised outdoor activity requiring basic skills
 - b.7 SRO ORE 002A Participate in a supervised outdoor recreation activity requiring basic skills
 - b.8 SRO OPS 001A Implement minimum environmental impact practices
 - b.9 SRO YAC 001A Comply with maritime rules and regulations
- f. For the purpose of integrated assessment, this unit may be assessed in conjunction with the following unit(s):
 - c.7 SRO NAV 001A Navigate in tracked or easy untracked areas

27. Required knowledge and skills

- a. Underpinning knowledge
 - a.1 Types of all small boats and rigs, sizes and suitability
 - a.2 Types of Personal Floatation Devices (PFD) (1,2 and 3) and situations where each is applicable
 - a.3 Types, uses and capabilities of wetsuits and drysuits
 - a.4 Other necessary equipment (boots, gloves, hats)

Metal and Engineering Training Package

SROYSB001A Use Basic Skills to Sail a Small Boat in Controlled Conditions

	<ul style="list-style-type: none"> a.5 Parts of a small boat a.6 Equipment maintenance a.7 The main points of sailing and sail positions a.8 Principles of tacking and gybing a.9 Sailing terms/terminology (port/starboard, windward, leeward) a.10 Locations for sailing <ul style="list-style-type: none"> b. Underpinning skills <ul style="list-style-type: none"> b.1 Tacking b.2 Gybing b.3 Reaching b.4 Sailing upwind b.5 Sailing downwind
28. Resource implications	<ul style="list-style-type: none"> c. Assessment of this competency requires access to a suitable location and conditions (enclosed water, light winds), a small sailing craft and buoys to mark courses d. Assessment of this competency will require human resources consistent with those outlined in the Assessment Guidelines
29. Consistency in performance	<ul style="list-style-type: none"> b. Competence in this unit must be assessed over a period of time (ie over several marked courses in controlled conditions) in order to ensure consistency of performance over the range of variables and contexts applicable
30. Context for assessment	<ul style="list-style-type: none"> a. Competency must be demonstrated in a sailing activity in the specified conditions. Some components may be assessed on land b. In cases where the learner does not have the opportunity to cover one category of small boat and all categories of each range of variables statements that are applicable to the type of boat sailed and the learners environment, the remainder should be assessed through realistic simulations, projects, previous relevant experience or oral questioning on "What if?" scenarios c. Assessment of this unit of competence will usually include observation of processes and procedures, oral and/or written questioning on underpinning knowledge and skills and consideration of required attitudes d. Where performance is not directly observed and/or is required to be demonstrated over a "period of time" and/or in a "number of locations", any evidence should be authenticated by colleagues, supervisors, clients or other appropriate persons

KEY COMPETENCIES						
Collect, Analyse & Organise Information	Communicate Ideas & Information	Plan & Organise Activities	Work with Others & in Teams	Use Mathematical Ideas & Techniques	Solve Problems	Use Technology
1	1	1	1	1	1	1

SRO YSB 002A SAIL A SMALL BOAT IN LIGHT TO MODERATE CONDITIONS USING ENHANCED SKILLS

YSB

Yachting (Small boat)

DESCRIPTION: This unit deals with the enhanced knowledge and skills necessary to rig and sail a small boat to best advantage, using a variety of techniques in light to moderate conditions and under minimal guidance.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Select equipment and prepare for participation</p>	<p>a. Information on weather and wind conditions is sourced to enable selection of a location to suit personal skill level</p> <p>b. Clothing suitable for the prevailing and expected conditions is selected</p> <p>c. Risks associated with the sailing environment are identified and strategies are implemented to reduce risks</p> <p>d. Safety equipment is worn/used in accordance with state/territory legislation and weather and light conditions</p>
<p>2. Rig and de-rig a small boat</p>	<p>a. Running and standing rigging</p> <p>b. The different types of cleat, and their use is identified</p> <p>c. Cunningham eye system and outhaul</p> <p>d. Features of different sails, and their uses, are correctly identified</p> <p>e. Fittings on mast, and boom are correctly identified and sails are correctly rigged using appropriate knots</p> <p>f. Knots which are useful in the activity of sailing are tied, and their advantages, disadvantages and applications described</p>
<p>3. Sail a marked course in light to moderate conditions using enhanced skills</p>	<p>a. The points of sailing are identified</p> <p>b. The points of sailing given the direction of the wind relative to the small boat are identified</p> <p>c. Primary boat controls are utilised to sail the boat through tacks and gybes and the techniques of roll tacking and roll gybing are correctly demonstrated where appropriate</p> <p>d. Common terminology with respect to the wind is identified and knowledge of wind, wind indicators and directional change in relation to wind is applied to determine the sailing directions, based on current wind direction</p> <p>e. Steering, speed and balance are maintained</p> <p>f. Knowledge and awareness of wind direction relative to the boat, points of sail and a combination of techniques is used to manoeuvre a small boat in light to moderate conditions using the tiller extension where necessary to sail a course which includes windward and downwind legs</p> <p>g. Compliance with all relevant collision and water traffic regulations is demonstrated and small boat is sailed within designated/defined areas</p> <p>h. Communication with other craft and with other crew members, where appropriate, is maintained</p>
<p>4. Handle a spinnaker</p>	<p>a. Situations in which the spinnaker can be utilised are identified</p> <p>b. Component parts of the spinnaker are correctly identified and situations in which a spinnaker could be used are determined</p> <p>c. A spinnaker is correctly rigged, set, gybed and dropped in light to moderate conditions</p> <p>d. The ability to steer a small boat under spinnaker in light to moderate conditions is demonstrated</p>
<p>5. Use a trapeze</p>	<p>h. Situations in which trapezing is used are identified and demonstrated</p>

	<ul style="list-style-type: none"> i. Component parts of the trapeze system are identified and the trapeze harness is adjusted and fitted in accordance with manufacturer's recommendations j. The ability to sail on trapeze in favourable conditions is demonstrated k. A boat is steered with a crew on trapeze in favourable conditions, demonstrating the ability to get in, get out, tack and gybe
<p>6. Perform crew recovery and towing drills independently</p>	<ul style="list-style-type: none"> a. Reasons for the loss of crew overboard are identified b. A crew member lost overboard is recovered in a safe and effective manner, using effective communication, correct technique and order of events, as part of a team c. Appropriate recovery side, approach speed and stopping technique is demonstrated to ensure efficient recovery and minimize risk of injury to crew in water d. A small boat is prepared for towing correctly and efficiently e. The boat is towed safely in single and/or multiple tow situations f. The boat is released from the tow safely, demonstrating awareness of factors to be considered when releasing from a multiple-tow situation
<p>7. Bring a small boat alongside a fixed or unfixed structure</p>	<ul style="list-style-type: none"> a. Small boat is safely and accurately brought alongside a wharf or anchored vessel/object without damage or injury to boat or persons
<p>8. Care for and stow/store equipment</p>	<ul style="list-style-type: none"> a. Factors causing equipment damage in the sailing environment are identified, and strategies implemented to improve equipment wear b. Sail and rig are maintained and stowed, in accordance with manufacturer's recommendations c. Other equipment is washed, dried and stowed in accordance with manufacturer's recommendations to ensure maximum lifespan and reduce damage d. Small boat is carried in a manner to minimize hull damage e. Trailers and trolleys are maintained to minimize rust on frames and bearings

Range of Variables

SAIL A SMALL BOAT IN LIGHT TO MODERATE CONDITIONS USING ENHANCED SKILLS

VARIABLE STATEMENT	CATEGORIES
1. Appropriate knots	<ul style="list-style-type: none"> hh. figure of eight ii. bowline jj. half hitch kk. reef knot ll. rolling hitch
2. Cleats	<ul style="list-style-type: none"> a. cam b. clam c. horn d. V cleats
3. Collision and water traffic regulations	<ul style="list-style-type: none"> a. Port gives way to starboard b. windward boat keeps clear c. overtaking boat keeps clear d. keep to the right in channels - turn right, pass port to port e. power gives way to sail f. right of way for commercial vessels
4. Enhanced skills	<ul style="list-style-type: none"> a. roll tacking b. roll gybing c. spinnaker handling d. trapezing e. perform crew recovery drill f. perform towing drill
5. Equipment	<ul style="list-style-type: none"> a. wetsuits b. boots c. gloves d. spray jacket e. hats/caps f. Personal Floatation Devices g. craft
6. Equipment care	<ul style="list-style-type: none"> a. sail and rig care b. carrying/transport of small boat c. washing and stowage of small boat and sail d. care of Personal Floatation Devices and wetsuits e. maintenance of trailers and trolleys
7. Factors to be considered when releasing from a multiple-tow situation	<ul style="list-style-type: none"> aa. clear communication between all boats and tow boat bb. awareness of position of main tow line cc. staying to appropriate side of main tow line dd. order of release ee. release synchronisation
8. Light to	<ul style="list-style-type: none"> a. winds 8-18 knots

moderate conditions	b. wave height to 0.5m
9. Parts of a spinnaker	ff. halyard gg. sheets hh. pole ii. up haul jj. kicker kk. corners - head and clews ll. luff/leeches and foot
10. Primary boat controls	a. mainsail b. jib c. balance d. trim e. centreboard
11. Risks	a. sun burn b. windburn c. marine stingers d. drowning e. dehydration f. hypothermia
12. Safe and accurate coming alongside	a. safe approach b. consideration of protruding body parts c. slow, controlled approach d. holding on and making fast
13. Sails	mm. mainsail nn. jib oo. spinnaker
14. Small boats	a. small (18ft and under) unballasted mono or multi hulled vessel with one mast b. stayed or unstayed mast c. one, two or three sails d. one or more crew members
15. Towing correctly and efficiently	a. secure line to fixed object close to the boat's centreline with turns to take load (not knots) b. main towline is positioned correctly c. centreboard is at least half up d. crew weight aft
16. Trapeze	a. full harness b. half harness
17. Wind direction	may be determined by: a. flags b. smoke c. ripples on the water d. moored boats e. wind on the face
18. Wind terminology	a. wind aft b. upwind c. downwind d. wind abeam e. head to wind f. luffing g. windward h. leeward

Metal and Engineering Training Package

SROYSB002A Sail a Small Boat in Light to Moderate Conditions Using Enhanced Skills

Evidence Guide

SAIL A SMALL BOAT IN LIGHT TO MODERATE CONDITIONS USING ENHANCED SKILLS

1. Critical aspects of evidence to be considered

- a. Assessment must confirm sufficient knowledge of sailing theory and sailing conditions to perform basic manoeuvres
- b. Assessment of performance should be over a period of time covering one category of small boat and all categories of each range of variables statements that are applicable to the type of boat sailed and the learner's environment
- c. In particular, assessment must confirm the ability to manoeuvre a small boat in light to moderate conditions, demonstrating the ability to:
 - c.1 Sail around a marked course including all major points of sailing in light to moderate conditions without instructor guidance
 - c.2 Use sails and balance (primary boat controls) to steer/sail the small boat around a marked course
 - c.3 Independently perform a crew recovery drill in light to moderate conditions
 - c.4 Select equipment for personal use as well as to care for equipment appropriately

Note: Where learners sail in small boats with more than one crew member, ability to perform all roles required to sail the boat, eg, crewing and helming, must be demonstrated.

2. Interdependent assessment of units

- a. This unit must be assessed after attainment of competency in the following unit(s):
 - a.1 SRO YAC 001A Comply with maritime rules and regulations
 - a.2 SRO YSB 001A Use basic skills to sail a small boat in controlled conditions
- b. This unit must be assessed in conjunction with the following unit(s):
 - b.1 SRO ORE 003A Prepare to participate in outdoor activities
 - b.2 SRO ORE 004A Participate in outdoor activities
 - b.3 SRO OPS 002A Plan for minimal environmental impact
- c. For the purpose of integrated assessment, this unit may be assessed in conjunction with the following unit(s):
 - c.1 SRO NAV 001A Navigate in tracked or easy untracked areas

3. Required knowledge and skills

- a. Underpinning knowledge
 - Wind indicators
 - Equipment maintenance
 - The main points of sailing and sail positions
 - Principles of tacking and gybing
 - Sailing terms/terminology (port/starboard, windward, leeward)
 - Use of spinnaker and trapeze

	<ul style="list-style-type: none"> b. Underpinning skills <ul style="list-style-type: none"> b.1 Tacking upwind b.2 Gybing downwind b.3 Sailing close hauled b.4 Running b.5 Reaching b.6 Rescue drills b.7 Use of spinnaker and trapeze
4. Resource implications	<ul style="list-style-type: none"> a. Assessment of this competency requires access to a suitable location and conditions (enclosed water, light winds), a small boat, and buoys to mark a course b. Assessment of this competency will require human resources consistent with those outlined in the Assessment Guidelines
5. Consistency in performance	<ul style="list-style-type: none"> a. Competence in this unit must be assessed over a period of time (ie over several marked courses in light to moderate conditions) in order to ensure consistency of performance over the range of variables and contexts applicable
6. Context for assessment	<ul style="list-style-type: none"> a. Competency must be demonstrated in a sailing activity in the specified conditions. Some components may be assessed on land b. In cases where the learner does not have the opportunity to cover one category of small boat and all categories of each range of variables statements that are applicable to the type of boat sailed and the learners environment, the remainder should be assessed through realistic simulations, projects, previous relevant experience or oral questioning on "What if?" scenarios c. Assessment of this unit of competence will usually include observation of processes and procedures, oral and/or written questioning on underpinning knowledge and skills and consideration of required attitudes d. Where performance is not directly observed and/or is required to be demonstrated over a "period of time" and/or in a "number of locations", any evidence should be authenticated by colleagues, supervisors, clients or other appropriate persons

KEY COMPETENCIES						
Collect, Analyse & Organise Information	Communicate Ideas & Information	Plan & Organise Activities	Work with Others & in Teams	Use Mathematical Ideas & Techniques	Solve Problems	Use Technology
2	2	2	2	2	2	2

SRX EME 002A PARTICIPATE IN THE CONTROL OF MINOR EMERGENCIES

EME Emergency response

DESCRIPTION: This unit covers the knowledge and skills to deal with, or participate in the control of, emergencies which are not initially or potentially life threatening.

ELEMENT	PERFORMANCE CRITERIA
1. Evaluate the emergency	a. The emergency situation is correctly established and classified and the likely effectiveness of initial response action determined b. Advice sought from relevant people , if appropriate, in evaluating the emergency c. Situations where initial response actions are not safe or are likely to be ineffective are reported according to procedures
2. Safely confine emergencies	a. Emergencies are confined to the area of origin, where possible, according to operating procedures b. Emergency control equipment and facilities used to confine emergency situations are used in a manner that will promote and enhance safe working conditions for self and others c. Emergency control equipment and facilities are used within the limitations imposed by current skills and relevant operating procedures d. Manufacturer's specifications, environmental requirements and operating procedures are identified and applied throughout
3. Use initial response emergency equipment	a. Appropriate equipment is selected to address emergency situations b. Equipment is checked to ensure it is safe and ready for use c. Equipment is used in accordance with accepted safety practices d. Use of equipment is coordinated with other emergency actions
4. Report the use of initial response emergency equipment	a. Emergency equipment is marked or positioned after use to indicate it requires servicing or replacing b. The use of initial response emergency equipment is reported according to organisation's policies and procedures

Range of Variables

PARTICIPATE IN THE CONTROL OF MINOR EMERGENCIES

VARIABLE STATEMENT	CATEGORIES
1. Checking procedures	<ul style="list-style-type: none"> a. written instructions b. company literature c. Occupational Health and Safety legislation d. codes of practices e. legislative requirements
2. Classification of the emergency	<p>Factors to be considered</p> <ul style="list-style-type: none"> a. nature and size b. likely development c. availability of support d. means of escape e. availability of control equipment or facilities f. likely effects on activity, clients and others
3. Confinement methods	<ul style="list-style-type: none"> a. closing doors b. shutting down equipment c. using emergency control equipment such as fire blankets, spill control kits d. sport and recreation or activity-specific confinement methods
4. Emergency control equipment and facilities	<ul style="list-style-type: none"> a. fire doors b. fire sprinkler systems and alarm systems c. first aid kits d. portable fire extinguishers and fire hose-reels e. smoke vents f. fire blankets g. spill control kits h. ice packs i. water j. thrown bags and buoys k. sport and recreation or activity-specific emergency equipment and facilities
5. Emergency situations	<ul style="list-style-type: none"> a. fires b. fuel and other spills

	<ul style="list-style-type: none"> c. process overheating d. equipment loss or failure e. activity and site specific situations
6. Initial response	<ul style="list-style-type: none"> a. use of portable fire extinguishers b. hose reels suppression systems c. removal of the emergency d. use of first aid kit e. pressure immobilisation f. throwing buoyant objects g. throwing water or blanket over a fire h. isolating victims and others from danger i. application of ice pack
7. Marking and positioning equipment to indicate it has been operated	<ul style="list-style-type: none"> a. not replacing emergency response equipment in usual storage site and/or manner b. disposing of contaminated spill absorbent correctly c. completion of usage forms and re-ordering of supplies in first aid kits d. procedures specific to sport and recreation or activity specific emergency response equipment (eg, indicating need for refilling, recoiling, retesting, repackaging, refreezing, refolding)
8. Operating procedures	<ul style="list-style-type: none"> a. the organisation's emergency procedures or practices and/or operating instructions or procedures for emergency control equipment
9. Other emergency actions	<ul style="list-style-type: none"> a. shutdown procedures and evacuation
10. Relevant people	<ul style="list-style-type: none"> a. other emergency team members b. emergency response related persons as detailed in emergency procedures
11. Reporting procedures	<ul style="list-style-type: none"> a. chief warden b. emergency response team leader c. fire/safety officer d. security officer or supervisor
12. Reports	<ul style="list-style-type: none"> a. initiate incident investigations b. record details of emergencies c. upgrade emergency equipment d. ensure equipment is restored to service

Metal and Engineering Training Package

SRXEMEOO2A Participate in the Control of Minor Emergencies

PARTICIPATE IN THE CONTROL OF MINOR EMERGENCIES

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm sufficient knowledge of practices to deal with minor emergencies which are not initially life threatening and to correctly use initial response equipment in the work environment</p> <p>b. Assessment of performance should be over a period of time covering all categories of the range of variable statements that are applicable in the learners environment</p> <p>c. In particular, assessment must confirm the ability to:</p> <p>c.1 identify factors affecting the classification and severity of emergencies</p> <p>c.2 identify situations that must not be attacked because of risk to life</p> <p>c.3 demonstrate correct actions and procedures when first attack is not safe</p> <p>c.4 apply correct initial response procedures</p> <p>c.5 apply procedures for marking or positioning emergency equipment to indicate that it has been used and requires servicing</p> <p>c.6 report the use of emergency equipment</p>
<p>2. Interdependent assessment of units</p>	<p>a. This unit must be assessed after attainment of competency in the following unit(s):</p> <p>a.1 SRX EME 001A React safely in an emergency and help prevent emergencies</p> <p>b. This unit must be assessed in conjunction with the following unit(s):</p> <p>b.1 SRX OHS 001A Follow defined Occupational Health and Safety policy and procedures related to the work being undertaken in order to ensure that own safety and that of others in the workplace</p> <p>c. For the purpose of integrated assessment, this unit may be assessed in conjunction with the following unit(s):</p> <p>c.1 Nil</p>
<p>3. Required knowledge and skills</p>	<p>a. Underpinning knowledge</p> <p>a.1 Limitations of initial response equipment</p> <p>a.2 Hazards involved with initial response action</p> <p>a.3 Limitations of use of emergency control equipment or facilities</p> <p>a.4 Select and use appropriate initial response equipment</p> <p>a.5 Implications of the incorrect use of equipment</p>

	<p>a.6 Operating procedures with respect to the use of emergency control equipment or facilities</p> <p>a.7 Reporting procedures in the event of an emergency</p> <p>a. Underpinning skills</p> <p>b.1 Numeracy and literacy skills to report and record emergencies and emergency response</p> <p>b.2 First aid and emergency response skills appropriate to the level of responsibility and location</p>
4. Resource implications	<p>a. Assessment of this competency requires access to initial response emergency equipment relevant to the work environment</p> <p>b. Assessment of this competency will require human resources consistent with those outlined in the Assessment Guidelines</p>
5. Consistency in performance	<p>a. Competence in this unit must be assessed over a period of time in order to ensure consistency of performance over the range of variables and contexts applicable to the work environment</p>
6. Context for assessment	<p>a. Competency must be demonstrated in a real work environment</p> <p>b. In cases where the learner does not have the opportunity to cover all relevant categories of the range of variables statements in the work environment, the remainder should be assessed through realistic simulations, projects, previous relevant experience or oral questioning on “What if?” scenarios</p> <p>c. Assessment of this unit of competence will usually include observation of processes and procedures, oral and/or written questioning on underpinning knowledge and skills and consideration of required attitudes</p> <p>d. Where performance is not directly observed and/or is required to be demonstrated over a “period of time” and/or in a “number of locations”, any evidence should be authenticated by colleagues, supervisors, clients or other appropriate persons</p>

KEY COMPETENCIES						
Collect, Analyse & Organise Information	Communicate Ideas & Information	Plan & Organise Activities	Work with Others & in Teams	Use Mathematical Ideas & Techniques	Solve Problems	Use Technology
1	1	1	1	-	1	-

SRX EME 003A

RESPOND TO EMERGENCY SITUATIONS

EME

Emergency response

DESCRIPTION: This unit covers the knowledge and skills to recognise potential risks and emergency situations and to take action, within own area of responsibility and ability.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Evaluate the emergency</p>	<ul style="list-style-type: none"> a. Emergency reports and signals are correctly identified and actioned and emergency and potential emergency situations are promptly recognised and assessed b. Advice is sought from relevant people, if appropriate, in evaluating the emergency c. Situations where initial response actions are not safe or are likely to be ineffective, are not attacked and are reported according to procedures d. The possible development of the emergency situation is assessed and further potential hazards to clients and staff are evaluated e. Injuries are assessed and treated appropriately f. The situation variables are examined g. Needs, including those for assistance, are prioritised promptly and accurately
<p>2. Develop a plan of action</p>	<ul style="list-style-type: none"> t. Options for action are identified and evaluated u. Available resources are used efficiently v. The plan developed balances group and individual safety with contextual issues w. The involvement of other individuals in the plan is outlined x. Organisational emergency procedures and policies are correctly implemented as part of the plan of action y. Occupational health and safety requirements and safe working practices are applied in the plan of action, including the selection of personal protective clothing and equipment to suit the emergency situation
<p>3. Control the emergency</p>	<ul style="list-style-type: none"> d. The plan of action is implemented using techniques appropriate to the situation and available resources and abilities e. Equipment is operated safely and, where necessary, equipment and techniques are improvised f. Strategies for group control are identified and implemented and clients and other individuals are removed from danger g. The condition of all clients, staff and others assisting is constantly monitored h. The information required to assist emergency services, where relevant, is acquired and documented i. Where required, emergency services are notified j. The plan of action is changed to accommodate changes in the situation variables k. Casualty evacuation methods are demonstrated where relevant to the context l. Organisational procedures and policies and legal requirements are correctly implemented in the event of a major injury or death
<p>4. Debrief the emergency</p>	<ul style="list-style-type: none"> l. Management authorities are notified m. The information appropriate to be given to facility or land management authorities is obtained n. Clients and others directly involved are debriefed and arrangements made for further counselling, if required o. Clients and others directly involved are advised to refer media enquires to a nominated spokesperson

Range of Variables

RESPOND TO EMERGENCY SITUATIONS

VARIABLE STATEMENT	CATEGORIES
1. Clients	<ul style="list-style-type: none"> a. participants in an activity or program b. colleagues c. small group or larger group d. experienced or inexperienced
2. Contextual issues	<ul style="list-style-type: none"> pp. acceptability to group/party members qq. degree of urgency rr. time constraints ss. impact on the environment
3. Development of situation	<ul style="list-style-type: none"> a. spread of fire b. threat to adjoining areas c. danger of explosion d. loss of communications e. involvement of additional persons
4. Emergencies	<ul style="list-style-type: none"> e. fire f. hazardous releases, chemical spills g. bomb threats h. civil disorder i. medical (eg, bites, stings, epileptic fit, heart attack) j. injuries k. panic and other emotional responses l. equipment failure m. lost party or party member n. result of environmental conditions (eg, heat, cold, wet, snow, wind, blizzards, lightning, bushfires, floods, high seas) o. activity-specific (eg, stranded, "frozen" or wedged participant)
5. Emergency reports and signals	<ul style="list-style-type: none"> a. observation b. verbal c. emergency warning system d. emergency alarm system e. hand signals f. verbal reports g. telephone communications h. radio communications i. whistles
6. Emergency Services	<ul style="list-style-type: none"> a. Police Search and Rescue b. State Emergency Service c. Fire Brigade

	<ul style="list-style-type: none"> d. Ambulance Service e. Land Management Authorities (eg, National Parks, Forestry) f. Australian Volunteer Coastguard
7. Hazards	<ul style="list-style-type: none"> a. biological b. chemical c. mechanical d. electrical e. thermal f. explosive g. structural h. climatic i. psychological (eg, critical incident stress) j. nuclear k. security related l. wildlife related
8. Management authorities	<ul style="list-style-type: none"> tt. Facility owners uu. City Councils, Local Government authorities vv. National Parks and Forestry services ww. Fisheries departments xx. private land owners, crown land lessees, Defence forces yy. Aboriginal communities, zz. Water authorities aaa. Commissions (eg, hydro-electricity, alpine resort)
9. Occupational health and safety requirements	<ul style="list-style-type: none"> a. State/territory/commonwealth legislation b. Australian Standards c. Occupational Health and Safety legislation d. industry codes of practice e. organisation's policies and procedures
10. Personal protective equipment	<ul style="list-style-type: none"> a. firefighter protective clothing b. helmets c. boots d. gloves e. breathing apparatus f. protective clothing g. protective hose lines or sprays h. safety eye washes i. safety showers
11. Plans of action	<ul style="list-style-type: none"> a. Search procedures (search of likely routes followed, systematic search, voice or whistle contacts) b. evacuations c. control of fire d. administering of first aid e. assistance to injured party member f. retrieval of party member g. activity-specific rescue techniques
12. Relevant people to assist evaluation	<ul style="list-style-type: none"> ff. other emergency team members gg. emergency response related persons as detailed in emergency procedures

Metal and Engineering Training Package

SRXEMEOO3A Respond to Emergency Situations

13. Resources	mm. other clients/group members nn. food oo. equipment pp. client's experience
14. Situation variables	ee. capabilities of the group/clients ff. weather conditions gg. topography hh. time frame for survival ii. other time factors jj. human resources kk. available food and water ll. size of search area mm. time of day nn. communications facilities and difficulties oo. emotional and physical condition of the clients/group

RESPOND TO EMERGENCY SITUATIONS

<p>1. Critical aspects of evidence to be considered</p>	<ul style="list-style-type: none"> w. Assessment must confirm sufficient knowledge of potential emergency situations within the community recreation, fitness, outdoor recreation or sport industry and must confirm the ability to apply knowledge of emergency procedures to the management of activity-specific emergencies x. Assessment of performance should be over a period of time covering all categories of each range of variable statements that are applicable in the learners environment y. In particular, assessment must confirm the ability to <ul style="list-style-type: none"> c.1 accurately evaluate the emergency c.2 avoid/control escalation of the emergency c.3 develop a plan of action decisively c.4 efficiently implement a plan of action c.5 deal with contingencies
<p>2. Interdependent assessment of units</p>	<ul style="list-style-type: none"> a. This unit must be assessed after attainment of competency in the following unit(s): <ul style="list-style-type: none"> a.1 SRX EME 002A Participate in the control of minor emergencies b. This unit must be assessed in conjunction with the following unit(s): <ul style="list-style-type: none"> b.1 activity specific or community recreation/fitness/outdoor recreation/sport specific emergency response or rescue units c. For the purpose of integrated assessment, this unit may be assessed in conjunction with the following unit(s): <ul style="list-style-type: none"> c.1 PUX EMEO 02A Manage injuries in emergency incident
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Underpinning knowledge <ul style="list-style-type: none"> a.1 First aid knowledge appropriate to the location a.2 Use of communications equipment a.3 Safety procedures near rescue equipment a.4 Organisational and legal policies and procedures in the event of an accident/incident a.5 Activity specific rescue techniques and/or emergency techniques specific to a sector of the sport and recreation industry a.6 Procedures to deal with death of a client b. Underpinning skills <ul style="list-style-type: none"> b.1 First aid skills appropriate to the location b.2 Activity specific rescue techniques or emergency response techniques b.3 Adaptability and resourcefulness to improvise resources and cope with contingencies b.4 Problem solving and contingency management b.5 Local call out procedures to access emergency services personnel
<p>4. Resource implications</p>	<ul style="list-style-type: none"> a. Assessment of this competency requires access to emergency response equipment appropriate to the learner’s work environment (ie, within the community

	<p>recreation, fitness, outdoor recreation or sport industry)</p> <p>b. Assessment of this competency will require human resources consistent with those outlined in the Assessment Guidelines</p>
5. Consistency in performance	<p>a. Competence in this unit must be assessed over a period of time in order to ensure consistency of performance over the range of variables, contexts and types of emergency situations applicable to a particular work environment within the sport and recreation industry</p>
6. Context for assessment	<p>a. Competency must be demonstrated in a real work environment</p> <p>b. In cases where the learner does not have the opportunity to cover all relevant categories of the range of variables statements in the work environment, the remainder should be assessed through realistic simulations, projects, previous relevant experience or oral questioning on “What if?” scenarios</p> <p>c. Assessment of this unit of competence will usually include observation of processes and procedures, oral and/or written questioning on underpinning knowledge and skills and consideration of required attitudes</p> <p>d. Where performance is not directly observed and/or is required to be demonstrated over a “period of time” and/or in a “number of locations”, any evidence should be authenticated by colleagues, supervisors, clients or other appropriate persons</p>

KEY COMPETENCIES						
Collect, Analyse & Organise Information	Communicate Ideas & Information	Plan & Organise Activities	Work with Others & in Teams	Use Mathematical Ideas & Techniques	Solve Problems	Use Technology
3	3	3	3	2	3	2

SRX EME 004A

COORDINATE EMERGENCY RESPONSE

EME

Emergency response

DESCRIPTION: This unit covers the knowledge and skills to coordinate a response to an emergency situation, in accordance with an organisation's policies and procedures.

ELEMENT	PERFORMANCE CRITERIA
1. Coordinate response to emergency reports or signals	e. Emergency <i>reports and signals</i> are correctly identified and actioned f. Where appropriate, <i>emergency stations</i> are attended and operated according to procedures g. <i>Emergency situations</i> are assessed and details reported according to procedures h. Emergency response actions are coordinated according to <i>procedures</i>
2. Anticipate the behaviour and characteristics of typical emergencies	a. An examination of the situation is conducted b. Emergency action plan is based on current situation and possible <i>development</i> c. Needs are prioritised promptly and accurately
3. Coordinate and apply operating instructions	a. Organisational emergency <i>procedures</i> and policies are correctly implemented b. <i>Occupational health and safety requirements</i> and safe working practices are applied
4. Coordinate the rescue procedure	a. The safe use of <i>emergency equipment</i> is determined and coordinated b. Equipment selection to match the type of emergency is supervised c. Selection of rescue technique is supervised to ensure safety and effectiveness d. Where necessary, equipment and techniques are improvised
5. Coordinate, initiate and control evacuation	a. Situations beyond the capability of the emergency team are referred promptly to the appropriate authorities for assistance b. Information and assistance is provided to relevant authorities c. If necessary, <i>emergency evacuation</i> is controlled and coordinated to organisational procedures or directions from relevant authorities

Metal and Engineering Training Package

SRXEMEOO4A Coordinate Emergency Response

	d. The <i>welfare</i> of non-evacuated persons is arranged and coordinated
6. Coordinate operational procedures	<p>a. An operational log is maintained throughout the rescue activity or completed immediately thereafter</p> <p>b. Emergency team members are advised to refer media inquiries to the nominated spokesperson</p>

Range of Variables

COORDINATE EMERGENCY RESPONSE

VARIABLE STATEMENT	CATEGORIES
1. Development	<ul style="list-style-type: none"> a. spread of fire b. threat to adjoining areas c. danger of explosion d. loss of communications and involvement of additional persons
2. Emergency equipment according to local policy	<ul style="list-style-type: none"> a. hoses, hose reels b. monitors c. foam equipment and extinguishers d. blankets e. spill kits f. personal protective clothing/equipment g. ladders h. salvage gear i. rescue equipment j. first aid and evacuation equipment /resources
3. Emergency evacuation	<ul style="list-style-type: none"> a. total b. partial c. to an external refuge d. to an internal refuge
4. Emergency situations	<ul style="list-style-type: none"> a. fire b. hazardous releases and uncontrollable processes c. smoke spread d. bomb threats or civil disorder e. environmental (severe storms, earthquakes, floods) f. other natural or man-made disasters g. specific emergencies occurring during participation in/conduct of sport and recreation activities
5. Emergency stations	<ul style="list-style-type: none"> a. emergency warning and control points b. assembly points c. fire points d. appropriate locations in <ul style="list-style-type: none"> d.1 snow

	<ul style="list-style-type: none">d.2 waterd.3 bush or cavesd.4 positions along the edge of the waterd.5 at the top or base of a pitch
6. Occupational health and safety requirements	<ul style="list-style-type: none">a. state legislationb. Australian standardsc. Occupational Health and Safety legislationd. industry codes of practicee. organisation's procedures
7. Procedures	<ul style="list-style-type: none">a. practices may be written or verbalb. instructions outlining the organisations fire and/or emergency procedures or practices and/or operating instructions and/or procedures for emergency control equipment
8. Reports and signals	<ul style="list-style-type: none">a. observationb. verbalc. emergency warning systemd. emergency alarm systeme. hand signalsf. verbal reportsg. telephone communicationsh. radio communicationsi. whistles
9. Welfare	<ul style="list-style-type: none">a. relocating evacuated person to other areasb. advising relativesc. arranging transport and collecting personal items

COORDINATE EMERGENCY RESPONSE

<p>1. Critical aspects of evidence to be considered</p>	<p>z. Assessment must confirm sufficient knowledge of the organisation's procedures and relevant Occupational Health and Safety legislation to assess emergency situations and coordinate a response to emergency situations within the community recreation, fitness, outdoor recreation or sport industry</p> <p>aa. Assessment of performance should be over a period of time covering all categories of each range of variable statement that are applicable in the learners environment</p> <p>bb. Assessment must confirm the ability to apply knowledge of emergency procedures to the coordination of general and sport or recreation activity-specific emergencies</p> <p>cc. In particular, assessment must confirm the ability to</p> <p>d.1 classify the emergency and recognise situations that must not be attacked because of risk of life</p> <p>d.2 recognise hazards and precautions to be taken during emergency response and actions to take in response to developing situations</p> <p>d.3 anticipate the escalation/development of the emergency situation</p> <p>d.4 correctly apply operating procedures, occupational health and safety requirements and legislation to the coordination of a response</p> <p>d.5 supervise the correct use of rescue techniques and equipment</p> <p>d.6 recognise equipment operation characteristics, limitations and procedures</p> <p>d.7 identify damaged, faulty or unserviceable equipment and recognise the hazards involved with the use of emergency equipment</p> <p>d.8 assess the need, type and level of evacuation and apply correct emergency evacuation procedures</p> <p>d.9 understand and/or use emergency evacuation signals or alarms</p> <p>d.10 maintain an operational log of the emergency actions</p> <p>d.11 deal with media inquiries in accordance with the organisation's procedures</p>
<p>2. Interdependent assessment of units</p>	<p>a. This unit must be assessed after attainment of competency in the following unit(s):</p> <p>a.1 SRX EME 003A Respond to emergency situations</p> <p>b. This unit must be assessed in conjunction with the following unit(s):</p> <p>b.1 activity specific or community recreation/fitness/outdoor recreation/sport specific emergency response or rescue units</p> <p>c. For the purpose of integrated assessment, this unit may be assessed in conjunction with the following unit(s):</p> <p>c.1 SRX OHS 002A Implement and monitor the organisation's Occupational Health and Safety policies, procedures and programs and maintain Occupational Health and Safety standards</p>
<p>3. Required knowledge and skills</p>	<p>a. Underpinning knowledge</p> <p>a.1 First aid knowledge and procedures</p> <p>a.2 Use of communications equipment</p> <p>a.3 Organisational and legal policies and procedures in the</p>

	<p>event of an accident/incident</p> <p>a.4 Activity specific rescue techniques</p> <p>a.5 Legal requirements in the event of a death</p> <p>a.6 Relevant emergency response agencies within the activity area/location and the process to contact them</p> <p>a.7 Organisation’s emergency plan and contingency plan</p> <p>b. Underpinning skills</p> <p>b.1 First aid procedures appropriate to the activity location</p> <p>b.2 Activity specific rescue techniques</p> <p>b.3 Problem solving to assess emergency situation and develop action plan</p> <p>b.4 Contingency management</p> <p>b.5 Adaptability and resourcefulness to improvise equipment/techniques</p>
<p>4. Resource implications</p>	<p>a. Assessment of this competency requires access to emergency response procedural documents and equipment appropriate to the learner’s work environment (ie, within the community recreation, fitness, outdoor recreation or sport industry)</p> <p>b. Assessment of this competency will require human resources consistent with those outlined in the Assessment Guidelines</p>
<p>5. Consistency in performance</p>	<p>a. Competence in this unit must be assessed over a period of time in order to ensure consistency of performance over the range of variables, contexts and types of emergency situations applicable to a particular work environment within the sport and recreation industry</p>
<p>6. Context for assessment</p>	<p>a. Competency must be demonstrated in a real work environment</p> <p>b. In cases where the learner does not have the opportunity to cover all relevant categories of the range of variables statements in the work environment, the remainder should be assessed through realistic simulations, projects, previous relevant experience or oral questioning on “What if?” scenarios</p> <p>c. Assessment of this unit of competence will usually include observation of processes and procedures, oral and/or written questioning on underpinning knowledge and skills and consideration of required attitudes</p> <p>d. Where performance is not directly observed and/or is required to be demonstrated over a “period of time” and/or in a “number of locations”, any evidence should be authenticated by colleagues, supervisors, clients or other appropriate persons</p>

KEY COMPETENCIES						
Collect,	Communicate	Plan &	Work with	Use	Solve Problems	Use

Metal and Engineering Training Package

SRXEMEOO4A Coordinate Emergency Response

Analyse & Organise Information	Ideas & Information	Organise Activities	Others & in Teams	Mathematical Ideas & Techniques		Technology
2	3	3	2	1	2	2

SRX RES 002A IMPROVE CLIENT AWARENESS AND IMPLEMENTATION OF ENVIRONMENTAL MANAGEMENT PRACTICES

RES Resource management

DESCRIPTION: This unit covers the knowledge and skills to improve awareness of environmental management practices within an organisation and inform external clients of the organisation’s practices.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Identify level of staff awareness and implementation of environmental management practices</p>	<p>a. Criteria for determining <i>staff awareness</i> and <i>effectiveness</i> of implementation of existing practices are developed</p> <p>b. Criteria are applied in order to determine relative effectiveness</p> <p>c. The need for modification or improvement of staff implementation of existing environmental practices is identified</p> <p>d. New areas which require implementation of environmental management practices in accordance with the organisation’s policies and environmental management plan are determined</p>
<p>2. Develop and rank methods to improve staff awareness and implementation of environmental management practices</p>	<p>a. Relevant information to assist staff awareness in environmental management is identified, researched and collated</p> <p>b. Specialist knowledge and skills are applied to determine the most suitable method</p> <p>c. Criteria to develop an effective ranking of practices is developed</p> <p>d. <i>Methods for improving staff awareness</i> and reaching identified areas of need is determined</p> <p>e. Information needs and opportunities for community involvement in improving awareness are established</p>
<p>3. Implement appropriate methods to improve staff awareness</p>	<p>a. Financial resources are identified and procured within budget cycles to support the achievement of required outcomes</p> <p>b. Personnel are identified, trained and assigned to tasks so that strategy requirements for skills and knowledge are met</p> <p>c. Physical facilities and equipment are identified and procured within budget cycles</p> <p>d. Information materials are prepared and distributed to ensure required awareness levels are achieved</p>

	<p>e. Improvement in staff awareness of environmental issues is achieved in accordance with local policy, procedures and relevant <i>legislative requirements</i></p>
<p>4. Monitor and review the levels of community awareness</p>	<p>a. Regular data are collected and analysed to provide accurate measures of performance</p> <p>b. Comparisons are made with required outcomes to assess performance</p> <p>c. Recommendations are made for changes to methods and systems</p> <p>d. Changes to methods and systems are made to ensure outcomes are achieved</p> <p>e. Information obtained during monitoring and review is used to develop new methods and systems which are based on accumulated knowledge and experience</p>
<p>5. Inform external clients of environmental management practices</p>	<p>a. Advantages of informing external clients of organisation's environmental management practices are identified and used to determine methods to improve their awareness</p> <p>b. Opportunities to inform external clients of organisation's environmental management practices are identified and supervisors/management are notified of new opportunities</p> <p>c. Resources and information required to inform external clients are identified and accessed within budget cycles</p> <p>d. Interactions with clients are used as an opportunity to inform them of the organisation's environmental management practices</p> <p>e. Strategies are developed to enable clients to participate in the implementation of the environmental management practices</p>

Range of Variables

IMPROVE CLIENT AWARENESS AND IMPLEMENTATION OF ENVIRONMENTAL MANAGEMENT PRACTICES

VARIABLE STATEMENT	CATEGORIES
1. Staff awareness	<ul style="list-style-type: none"> a. level of knowledge b. need for information c. awareness of methods of information distribution d. methods for suggesting improvements in systems e. internal system within the organisation
2. Effectiveness	<ul style="list-style-type: none"> a. the range of methods used b. consistency of involvement c. level and quality of training provided d. level and quality of involvement e. funding and resources required f. quality and level of benefit derived g. outcomes achieved and goals for improvement
3. Legislative context	<ul style="list-style-type: none"> a. State/Territory statutory requirements b. local laws, by-laws, ordinances and policy
4. Methods for improving awareness	<ul style="list-style-type: none"> a. significant use of resources b. minimal input of resources c. use of existing systems within the organisation d. high quality materials e. use of experts or consultants with relevant skills
5. Work environment	<p>varies with respect to</p> <ul style="list-style-type: none"> a. size of the organisation b. location c. organisational structure d. nature of service provided e. resource availability

IMPROVE CLIENT AWARENESS AND IMPLEMENTATION OF ENVIRONMENTAL MANAGEMENT PRACTICES

<p>1. Critical aspects of evidence to be considered</p>	<ul style="list-style-type: none"> a. Assessment must confirm sufficient knowledge of methods to determine staff awareness of the organisation’s environmental management strategies and the effectiveness of staff implementation of the strategies in the work environment b. Assessment of performance should be over a period of time covering all categories of the range of variables statements that are applicable in the learners work environment c. In particular, assessment must confirm the ability to: <ul style="list-style-type: none"> c.1 Determine the level of staff implementation of the organisation’s environmental management practices c.2 Develop appropriate methods to improve staff implementation of the organisation’s environmental management practices c.3 Accurately assess any improvement in implementation c.4 Assess client awareness of the organisation’s environmental management practices c.5 Improve external client awareness of the organisation’s environmental management practices
<p>2. Interdependent assessment of units</p>	<ul style="list-style-type: none"> a. This unit must be assessed after attainment of competency in the following unit(s): <ul style="list-style-type: none"> a.1 Nil b. This unit must be assessed in conjunction with the following unit(s): <ul style="list-style-type: none"> b.1 Nil c. For the purpose of integrated assessment, this unit may be assessed in conjunction with the following unit(s): <ul style="list-style-type: none"> c.1 Nil
<p>3. Required knowledge and skills</p>	<ul style="list-style-type: none"> a. Underpinning knowledge <ul style="list-style-type: none"> a.1 Environmental issues a.2 Community needs and expectations a.3 Organisation structure and services a.4 Training requirements/networks a. Underpinning skills

	<ul style="list-style-type: none"> b.1 Research skills to identify information relevant to issues b.2 Consultation skills to deal with people at all levels b.3 Presentation skills to report to management and clients on initiatives b.4 Programming skills b.5 Strategic planning skills to integrate minor program goals with organisation goals b.6 Budgeting skills to manage finances for programs b.7 Evaluation skills to monitor effectiveness
4. Resource implications	<ul style="list-style-type: none"> a. Assessment of this competency requires access to a work environment b. Assessment of this competency will require human resources consistent with those outlined in the Assessment Guidelines
5. Consistency in performance	<ul style="list-style-type: none"> a. Competence in this unit must be assessed over a period of time in order to ensure consistency of performance over the range of variables and contexts applicable to the work environment
6. Context for assessment	<ul style="list-style-type: none"> a. Competency must be demonstrated in a real work environment b. In cases where the learner does not have the opportunity to cover all categories of the range of variables statements that are applicable in the learners work environment, the remainder should be assessed through realistic simulations, projects, previous relevant experience or oral questioning on “What if?” scenarios c. Assessment of this unit of competence will usually include observation of processes and procedures, oral and/or written questioning on underpinning knowledge and skills and consideration of required attitudes d. Where performance is not directly observed and/or is required to be demonstrated over a “period of time” and/or in a “number of locations”, any evidence should be authenticated by colleagues, supervisors, clients or other appropriate persons

KEY COMPETENCIES						
Collect, Analyse & Organise Information	Communicate Ideas & Information	Plan & Organise Activities	Work with Others & in Teams	Use Mathematical Ideas & Techniques	Solve Problems	Use Technology
2	2	1	1	-	-	-

Metal and Engineering Training Package

SRXRESOO2A Improve Client Awareness and Implementation of Environmental Management Practices

SRX RES 004A MINIMISE WASTE AND POLLUTION AND THEIR ENVIRONMENTAL IMPACT

RES Resource management

DESCRIPTION: This unit covers the knowledge and skills to identify sources of waste and pollution, assess their impact and develop appropriate strategies to manage and minimise their environmental impact.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Identify quantity, composition and sources of waste and environmental pollution</p>	<p>a. Existing <i>data</i> is identified and collated in a comprehensive manner</p> <p>b. Additional <i>data</i> is obtained to ensure comprehensive <i>data</i> is available for analysis</p>
<p>2. Assess the impact of waste and pollution on the environment</p>	<p>a. Specialist skills and most effective method of assessing <i>waste</i> and <i>pollution</i> are identified</p> <p>b. The community is surveyed to determine awareness of <i>waste</i> and <i>pollution</i></p> <p>c. Relevant existing waste management practices and pollution conditions are assessed against legislation, industry standards, organisation and community requirements and expectations</p> <p>d. A cost impact analysis is undertaken of existing pollution condition on the <i>environment</i></p> <p>e. A <i>cost benefit</i> analysis is undertaken of existing waste management practices</p> <p>f. The effects of existing waste practices and pollution on the <i>environment</i> are regularly monitored</p> <p>g. The pollution cycle is established for each <i>pollution</i> component in the organisation area</p> <p>h. The waste impact cycle is established for each component of the <i>waste stream</i> in the organisation area</p> <p>i. Resource usage in the waste impact cycle and pollution cycle is measured accurately</p>
<p>3. Determine the effectiveness of current methods and standards in minimising</p>	<p>a. Waste minimisation and pollution standards are specified in accordance with community standards and relevant authority regulations</p> <p>b. Performance is measured accurately, regularly and in a cost effective manner</p> <p>c. Statistically valid comparisons are made between</p>

<p>waste and pollution</p>	<p>objectives and performance to accurately establish if standards have been met</p>
<p>4. Investigate, develop and prioritise achievable waste and pollution minimisation strategies</p>	<ul style="list-style-type: none"> a. Consultation with the community and relevant <i>authorities</i> is undertaken to determine appropriate objectives and levels of performance b. Practical and appropriate <i>strategies</i> to minimise <i>waste</i> and <i>pollution</i> are determined c. The effectiveness of <i>strategies</i> is assessed through a comparison with methods in practice elsewhere d. <i>Strategies</i> are assessed for cost effectiveness e. Trial and sampling techniques are implemented in a controlled manner and results assessed against strategy objectives f. <i>Strategies</i> are prioritised for implementation based on organisation and other relevant <i>authority</i> criteria g. <i>Strategies</i> are implemented within available resources in accordance with agreed priorities
<p>5. Implement strategies to minimise waste and environmental pollution</p>	<ul style="list-style-type: none"> a. Financial resources are identified and procured within budget cycles to support the achievement of required outcomes b. Personnel are identified, trained and assigned to tasks so that strategy requirements for skills and knowledge are met c. Physical facilities and equipment are identified and procured within budget cycles to support the achievement of required outcomes d. Community information materials are prepared and distributed based on outcomes of trials and sampling to ensure on-going support for the strategy e. Strategy is implemented in accordance with organisation policy and procedures
<p>6. Monitor and review the effectiveness of minimisation strategies</p>	<ul style="list-style-type: none"> a. Regular <i>data</i> is collected and analysed to provide accurate measures of performance b. Comparisons are made with strategy objectives to assess effectiveness c. Changes to implemented strategy are made as required in a timely manner to ensure outcomes are achieved d. Information obtained during monitoring and review is used to develop new <i>strategies</i> which are based on accumulated knowledge and experience

Range of Variables

MINIMISE WASTE AND POLLUTION AND THEIR ENVIRONMENTAL IMPACT

VARIABLE STATEMENT	CATEGORIES
1. Authorities	<ul style="list-style-type: none"> a. state environment protection authorities b. waste management bodies c. recycling and resource recovery bodies
2. Cost benefits	<ul style="list-style-type: none"> a. financial b. health c. amenity d. flora and fauna e. social f. fee for service
3. Data	<ul style="list-style-type: none"> a. types of waste/ pollution b. costs of reduction/disposal c. legislation d. impact details e. sources f. experimental controls g. quantities/levels
4. Data types	<ul style="list-style-type: none"> a. complaints b. officer observation c. monitoring and sampling d. historical records and reports e. water board (local) f. comparative external reports g. community environmental programs h. ABARE (Australian bureau of agricultural research and economics)
5. Environment	<ul style="list-style-type: none"> a. location/sites/areas b. those interacting in the environment, including <ul style="list-style-type: none"> b.1 flora and fauna b.2 persons interacting in the immediate vicinity a. includes cultural and heritage sites
6. Impacts	<ul style="list-style-type: none"> a. health related

	<ul style="list-style-type: none"> b. amenity <ul style="list-style-type: none"> b.1 smell b.2 visual (development of facilities and signs) b.3 tactile c. flow on physical impacts on flora and fauna d. toxicity (pollution with foreign matter) and chemical alteration to environment e. modification to breakdown / decomposition cycle f. intrusion into private lives and culture g. damage to, or inappropriate behavior in, cultural sites
7. Legislative context	<ul style="list-style-type: none"> a. State/Territory statutory requirements b. local laws, by-laws, ordinances and policy
8. Pollution	<ul style="list-style-type: none"> a. air b. water c. noise d. soil/land e. visual
9. Strategies	<ul style="list-style-type: none"> a. education b. promotion c. technical systems d. mulching e. worms
10. Waste stream	<ul style="list-style-type: none"> a. domestic garbage b. industrial c. commercial d. municipal litter
11. Waste	<ul style="list-style-type: none"> a. paper b. plastics c. metals d. household garbage e. green waste f. chemical g. glass h. construction waste i. hard liquid j. storm water k. sewage
12. Work environment	<p>varies with respect to</p> <ul style="list-style-type: none"> a. size of organisation b. location c. organisational structure d. nature of service provided e. resources available

Metal and Engineering Training Package

SRXRESOO4A Minimise Waste and Pollution and their Environmental Impact

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MINIMISE WASTE AND POLLUTION AND THEIR ENVIRONMENTAL IMPACT

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm sufficient knowledge of methods to determine the quantity, composition and sources of waste and pollution within the learner’s work environment and methods to minimise their impact on the environment</p> <p>b. Assessment of performance should be over a period of time covering all categories of pollution and environment from the range of variable statements and categories of impact and waste that are applicable in the learners environment</p> <p>c. In particular, assessment must confirm the ability to:</p> <p>c.1 Source relevant information on the quantity and composition of waste and pollution</p> <p>c.2 Identify sources of waste and pollution</p> <p>c.3 Assess the environmental impact of pollution and waste</p> <p>c.4 Evaluate current minimisation strategies</p> <p>c.5 Develop/improve strategies for waste and pollution minimisation</p> <p>c.6 Identify training and information requirements of staff</p> <p>c.7 Implement and monitor strategies to reduce environmental impact</p>
<p>1. Interdependent assessment of units</p>	<p>a. This unit must be assessed after attainment of competency in the following unit(s):</p> <p>a.1 SRX RES 002A Improve client awareness and implementation of environmental management practices</p> <p>a. This unit must be assessed in conjunction with the following unit(s):</p> <p>b.1 Nil</p> <p>c. For the purpose of integrated assessment, this unit may be assessed in conjunction with the following unit(s):</p> <p>c.1 Nil</p>
<p>1. Required knowledge and skills</p>	<p>a. Underpinning knowledge</p> <p>a.1 Organisation’s policies and procedures in regard to the environment</p> <p>a.2 Organisation’s structure, services and availability of resources</p> <p>a.3 Sources of relevant information/data</p>

	<ul style="list-style-type: none"> a.4 Techniques to assess environmental impact due to different components a.5 Waste management and minimisation practices a.6 Pollution management and minimisation practices a.7 Regulations/standards/policies as specified by local/state and national authorities a.8 Community needs and expectations a.9 Training requirements/networks <ul style="list-style-type: none"> a. Underpinning skills <ul style="list-style-type: none"> b.1 Research to source community information on environmental issues and to investigate the impact of pollution and waste on the environment b.2 Analysis of data (including adequate statistical analysis techniques) b.3 Monitoring and evaluation b.4 Consultation with diversity of people and organisations/bodies b.5 Strategic planning b.6 Program design b.7 Budgeting
<p>1. Resource implications</p>	<ul style="list-style-type: none"> a. Assessment of this competency requires the learner to have access to an organisation’s policies and procedures in order to assess the waste and pollution produced and develop strategies to minimise/manage the environmental impact b. Assessment of this competency will require human resources consistent with those outlined in the Assessment Guidelines
<p>1. Consistency in performance</p>	<ul style="list-style-type: none"> a. Competence in this unit must be assessed over a period of time in order to ensure consistency of performance over the range of variables and contexts applicable to the work environment
<p>1. Context for assessment</p>	<ul style="list-style-type: none"> a. Competency must be demonstrated in a real work environment b. In cases where the learner does not have the opportunity to cover all categories of pollution and environment from the range of variable statements and categories of impact and waste that are applicable in the work environment, the remainder should be assessed through realistic simulations, projects, previous relevant experience or oral questioning on “What if?” scenarios c. Assessment of this unit of competence will usually include observation of processes and procedures, oral and/or written questioning on underpinning knowledge and skills and consideration of required attitudes d. Where performance is not directly observed and/or is required to be demonstrated over a “period of time” and/or

Metal and Engineering Training Package

SRXRESOO4A Minimise Waste and Pollution and their Environmental Impact

in a “number of locations”, any evidence should be authenticated by colleagues, supervisors, clients or other appropriate persons

KEY COMPETENCIES						
Collect, Analyse & Organise Information	Communicate Ideas & Information	Plan & Organise Activities	Work with Others & in Teams	Use Mathematical Ideas & Techniques	Solve Problems	Use Technology
3	2	2	1	1	2	1

SRX RES 008A CONSERVE AND RE-ESTABLISH NATURAL SYSTEMS

RES Resource management

DESCRIPTION: This unit covers the knowledge and skills to prepare an inventory of natural systems, asses threats and opportunities and develop and implement strategies to conserve and re-establish natural systems.

ELEMENT	PERFORMANCE CRITERIA
<p>1. Prepare an inventory of natural systems and their components</p>	<p>a. <i>Natural systems</i> and components are identified within community and organisation expectations and requirements</p> <p>b. The significance of <i>natural systems</i> is specified in accordance with scientific criteria and community expectations</p> <p>c. <i>Existing data</i> is identified and reviewed to enable characteristics of the natural system to be specified</p> <p>d. Data is collected on <i>natural systems</i> accurately and objectively</p> <p>e. A comprehensive inventory of <i>natural systems</i> is prepared with full and detailed descriptors</p>
<p>2. Assess threats and opportunities for the conservation and re-establishment of natural systems</p>	<p>a. <i>Threats</i> and opportunities are identified in accordance with <i>legislative</i> and authority expectations so that all factors are fully assessed</p> <p>b. <i>Threats</i> and opportunities are prioritised based on type, level, land tenure and classification of <i>natural systems</i> in accordance with community expectations</p>
<p>3. Develop strategies for the conservation and re-establishment of natural systems</p>	<p>a. Consultation with the community and relevant authorities is undertaken to determine appropriate objectives and levels of performance</p> <p>b. Practical and appropriate strategies to conserve and re-establish <i>natural systems</i> are determined</p> <p>c. The effectiveness of strategies is assessed through a comparison with methods in practice elsewhere</p> <p>d. Proven techniques for the conservation and re-establishment of <i>natural systems</i> are applied within accepted procedures and environmental standards</p> <p>e. Alternative and innovative approaches are developed where appropriate to meet local requirements</p>

<p>4. Implement suitable strategies to conserve and re-establish natural systems</p>	<ul style="list-style-type: none">a. Financial resources are identified and procured within budget cycles to support the achievement of required outcomesb. Personnel are identified, trained and assigned to tasks so that strategy requirements for skills and knowledge are metc. Physical facilities and equipment are identified and procured within budget cycles to support the achievement of required outcomesd. Community information materials are prepared and distributed to ensure on-going support for the strategye. Innovative and alternative techniques are trialed so that results can be assessedf. Strategy is reviewed in accordance with trials undertakeng. Strategy is implemented within organisation policy and procedures and <i>legislative requirements</i>
<p>5. Monitor and review the effectiveness of strategies to conserve and re-establish natural systems</p>	<ul style="list-style-type: none">a. Regular data are collected and analysed to provide accurate measures to performanceb. Comparisons are made with strategy objectives to assess effectivenessc. Changes to implemented strategy are made as required in a timely manner to ensure outcomes are achievedd. Information obtained during monitoring and review is used to develop new strategies which are based on accumulated knowledge and experience

Range of Variables

CONSERVE AND RE-ESTABLISH NATURAL SYSTEMS

VARIABLE STATEMENT	CATEGORIES
1. Existing data sourced from	<ul style="list-style-type: none"> a. university b. consultants reports c. conservation and natural resources d. Land Conservation Council e. Port Authority f. state and federal bodies g. State Environmental Protection Authority h. interest groups i. referral bodies j. Municipal Planning Scheme k. environmentalists
2. Legislative context	<ul style="list-style-type: none"> a. state/territory statutory requirements b. local laws, by-laws, ordinances and policy
3. Natural systems	<ul style="list-style-type: none"> a. flora b. fauna c. species d. communities e. habitats f. regeneration g. re-vegetation h. fire management i. degradation factors
4. Threats	<ul style="list-style-type: none"> a. political emphasis b. economic rationalisation c. community attitude d. interest groups

CONSERVE AND RE-ESTABLISH NATURAL SYSTEMS

<p>1. Critical aspects of evidence to be considered</p>	<p>a. Assessment must confirm sufficient knowledge of techniques to determine the components of natural systems within a specific location/area and develop strategies to conserve and re-establish natural systems</p> <p>b. Assessment of performance should be over a period of time covering all relevant categories of data source and components of natural systems within the range of variable statements that are applicable to the location/area analysed</p> <p>c. In particular, assessment must confirm the ability to</p> <p>c.1 Prepare an accurate inventory of natural systems within a specific location/area</p> <p>c.2 Assess threats and opportunities for conservation of natural systems within a specific location/area</p> <p>c.3 Develop and implement suitable strategies to enable the conservation and re-establishment of natural systems within a specific location/area</p> <p>c.4 Monitor the effectiveness of the strategies and modify if required</p>
<p>2. Interdependent assessment of units</p>	<p>a. This unit must be assessed after attainment of competency in the following unit(s):</p> <p>a.1 SRX RES 004A Minimise waste and pollution and their environmental impact</p> <p>b. This unit must be assessed in conjunction with the following unit(s):</p> <p>b.1 Nil</p> <p>c. For the purpose of integrated assessment, this unit may be assessed in conjunction with the following unit(s):</p> <p>c.1 SRX RES 009A Achieve sustainable land management</p> <p>c.2 SRX RES 012A Develop a comprehensive and integrated environmental management strategy</p>
<p>3. Required knowledge and skills</p>	<p>a. Underpinning knowledge</p> <p>a.1 Conservation principles</p> <p>a.2 Research and analysis techniques</p> <p>a.3 Re-establishment of environments</p> <p>a.4 Community needs, expectations and attitudes</p> <p>a.5 Organisation's policies, goals and objectives</p> <p>a.6 Natural systems and interrelationships between</p>

	<p>components</p> <p>a.7 Political and economic trends</p> <p>a. Underpinning skills</p> <p>b.1 Research and analysis</p> <p>b.2 Monitoring and evaluation</p> <p>b.3 Collation of material from a range of sources</p> <p>b.4 Strategic planning</p> <p>b.5 Advanced communication skills to enable consultation with a diversity of stakeholders including community groups, government bodies and statutory authorities</p> <p>b.6 Budgeting</p>
<p>4. Resource implications</p>	<p>a. Assessment of this competency requires the learner to have access to a natural system for research, monitoring and evaluation</p> <p>b. Assessment of this competency will require human resources consistent with those outlined in the Assessment Guidelines</p>
<p>5. Consistency in performance</p>	<p>a. Competence in this unit must be assessed over a period of time in order to ensure consistency of performance over the range of variables and contexts applicable to the work environment</p>
<p>6. Context for assessment</p>	<p>a. Competency must be demonstrated in a real work environment</p> <p>b. In cases where the learner does not have the opportunity to cover all relevant categories of the range of variables statements in the work environment, the remainder should be assessed through realistic simulations, projects, previous relevant experience or oral questioning on “What if?” scenarios</p> <p>c. Assessment of this unit of competence will usually include observation of processes and procedures, oral and/or written questioning on underpinning knowledge and skills and consideration of required attitudes</p> <p>d. Where performance is not directly observed and/or is required to be demonstrated over a “period of time” and/or in a “number of locations”, any evidence should be authenticated by colleagues, supervisors, clients or other appropriate persons</p>

Metal and Engineering Training Package

SRXRESOO8A Conserve and Re-Establish Natural Systems

KEY COMPETENCIES						
Collect, Analyse & Organise Information	Communicate Ideas & Information	Plan & Organise Activities	Work with Others & in Teams	Use Mathematical Ideas & Techniques	Solve Problems	Use Technology
3	2	2	2	2	2	1

THHCOR02B Work in a socially diverse environment

Unit Descriptor

This unit deals with the cultural awareness that is required by all people working in the tourism and hospitality industries. It includes the cultural awareness required for serving customers and working with colleagues from diverse backgrounds.

Element	Performance Criteria
1 Communicate with customers and colleagues from diverse backgrounds	1.1 Value customers and colleagues from different cultural groups and treat them with respect and sensitivity.
	1.2 Take into consideration cultural differences in all verbal and non-verbal communication.
	1.3 Communicate through the use of gestures or simple words in the other person's language, where language barriers exist.
	1.4 Obtain assistance from colleagues, reference books or outside organisations when required.
2 Deal with cross cultural misunderstandings	2.1 Identify issues which may cause conflict or misunderstanding in the workplace.
	2.2 Address difficulties with the appropriate people and seek assistance from team leaders or others where required.
	2.3 Consider possible cultural differences when difficulties or misunderstandings occur.
	2.4 Make efforts to resolve misunderstandings, taking account of cultural considerations.
	2.5 Refer issues and problems to the appropriate team leader/supervisor for follow up.

Range Statement

This unit applies to all tourism and hospitality sectors. The following explanations identify how this unit may be applied in different workplaces, sectors and circumstances.

Cultural differences may arise from:

- race
- language
- special needs
- disabilities
- family structure
- gender
- age
- sexual preference.

Possible cultural differences may include those arising from:

- language spoken
- forms of address
- levels of formality/informality
- non-verbal behaviour, understandings and interpretations
- work ethics
- personal grooming
- dress
- family and social obligations and status
- observance of special religious, feast or other celebratory days
- customs, beliefs and values
- special needs
- product preferences.

Attempts to overcome language barriers may be made in order to:

- meet and greet/farewell customers
- give simple directions
- give simple instructions
- answer simple enquiries
- prepare for, serve and assist customers
- describe goods and services.

Outside organisations may include:

- interpreter services
- diplomatic services
- local cultural organisations
- appropriate government agencies
- educational institutions.

Evidence Guide

Essential Knowledge and Skills to Be Assessed

The following knowledge and skills must be assessed as part of this unit:

- principles that underpin cultural awareness
- characteristics of the different cultural groups in Australian society
- basic knowledge of the cultures of Australia's indigenous and non-indigenous peoples
- identification of various international tourist groups, as appropriate to the sector and individual workplace
- principles of Equal Employment Opportunity (EEO) and anti-discrimination legislation as they apply to individual employees.

Linkages to Other Units

This unit must be assessed with or after the following unit. These units describe skills and knowledge that are essential to this unit of competence. Continued training and assessment in this unit is recommended:

- THHCOR01B Work with colleagues and customers

This unit also has linkages to the following units and combined training and assessment is recommended:

- THHGCS02B Promote products and services to customers
- THHGCS03B Deal with conflict
- THTLANO101A Conduct basic workplace oral communications in a language other than English, and other Language Other than English units

Critical Aspects of Assessment

Evidence of the following is critical:

- cultural understanding and sensitivity in responding to different types of customers
- ability to identify and respond to the cultural context of the workplace
- ability to apply knowledge of different cultures and cultural characteristics appropriately to communication with colleagues and customers
- ability to communicate effectively with customers and colleagues from a broad range of backgrounds as required for the relevant job role.

Context of Assessment and Resource Implications

Assessment must ensure:

- project or work activities that allow the candidate to demonstrate knowledge and awareness of diversity issues in the workplace.

For generic pre-employment training and assessment, a range of industry contexts must be addressed. Where the focus is sector or workplace specific, training and assessment must be tailored to meet particular needs.

Assessment Methods

Assessment methods must be chosen to ensure that candidates are able to respond constructively to issues which arise in a culturally and socially diverse workplace. Methods must include assessment of knowledge as well as assessment of practical skills.

The following examples are appropriate for this unit:

- observation of the candidate interacting with colleagues and customers from diverse backgrounds
- case studies or projects to consider particular conflict situations arising from diversity and to suggest appropriate means of dealing with them
- questions about effective communication, problem-solving techniques and cultural values and differences
- review of portfolios of evidence and third party workplace reports of on-the-job performance by the candidate.

Key Competencies in this Unit

Key competencies are an integral part of all workplace competencies. The table below describes those applicable to this unit. Trainers and assessors should ensure that they are addressed in training and assessment.

Level 1 = Perform Level 2 = Administer and Manage Level 3 = Design and Evaluate

Key Competencies	Level	Examples
Collecting, Organising and Analysing Information	1	Identifying different cultural beliefs and values
Communicating Ideas and Information	2	Explaining how to do something to a colleague or customer from another language or cultural background
Planning and Organising Activities	1	Considering ways to deal with cultural conflicts or problems, or to improve workplace communication
Working with Others and in Teams	2	Working co-operatively with other members of the work team, including those from diverse backgrounds
Using Mathematical Ideas and Techniques	-	-
Solving Problems	2	Dealing with problems such as communication breakdowns and misunderstandings
Using Technology	-	-

THHGCS01B Develop and update local knowledge

Unit Descriptor

This unit deals with the skills and knowledge required to build and maintain the local knowledge that is required to effectively respond to general customer information requests in a range of tourism and hospitality enterprises. This unit reflects a context where the provision of information is not the primary job role (eg within an attraction or a restaurant). The unit has a link to unit THTSOP02B Source and provide destination information and advice, (Tourism Training Package) which reflects a context where provision of advice is the primary job role (eg. a visitor information officer or travel consultant).

Element	Performance Criteria
1 Develop local knowledge	1.1 Identify and access appropriate sources of information on the local area.
	1.2 Record and file information for further use as appropriate and in accordance with enterprise procedures.
	1.3 Identify and obtain the types of information commonly requested by customers.
2 Update local knowledge	2.1 Identify and use opportunities to update local knowledge.
	2.2 Share updated knowledge with customers and colleagues as appropriate and incorporate into day-to-day working activities.

Range Statement

This unit applies to all tourism and hospitality sectors. The following explanations identify how this unit may be applied in different workplaces, sectors and circumstances.

The range of local information required will vary according to the particular industry sector, location and individual workplace. Information must include:

- enterprise specific information
- local transport options
- local attractions
- local events
- general visitor facilities including shopping locations, currency exchanges, post offices, banks, emergency services.

Information may include:

- specific shopping details, markets
- restaurants, cafes and other dining venues
- other facilities and services such as hairdressers, dentists, travel agencies
- theatres and entertainment venues
- sporting facilities
- tours, local outings and trips
- travelling routes
- weather conditions.

Sources of information on the local area may include:

- brochures
- timetables
- local visitor guides
- library and local council
- local people
- enterprise information
- room directories
- maps
- Internet.

Opportunities to update local knowledge may include:

- talking and listening to colleagues and customers
- participation in local familiarisation tours
- visiting the local information centre
- personal observation/exploration
- watching TV, videos and films
- listening to radio
- reading local newspapers.

Evidence Guide

Essential Knowledge and Skills to be Assessed

The following knowledge and skills must be assessed as part of this unit:

- sources of information for enterprise and local knowledge
- general knowledge of the enterprise, local attractions, events, transport options, general visitor facilities including shopping, currency exchanges, post offices, banks, emergency services.

Linkages to Other Units

This unit underpins effective performance in a range of other units and combined training and assessment may be appropriate. Examples include:

- THHBH01B Provide housekeeping services to guests
- THHBF010B Provide porter services
- THHBF02B Provide accommodation reception services
- WRRS2B Advise on products and services
- many other units in the Attractions and Theme Parks section

Critical Aspects of Assessment

Evidence of the following is critical:

- ability to source accurate and current information on the local area
- general knowledge of the local area sufficient to answer commonly asked customer questions as relevant to the job role.

Context of Assessment and Resource Implications

Assessment must ensure:

- project or work activities that allow the candidate to respond to a range of commonly asked customer questions.

Assessment Methods

Assessment methods must be chosen to ensure that the application of knowledge to different customer service situations can be practically demonstrated. Methods must include assessment of knowledge as well as assessment of practical skills.

The following examples are appropriate for this unit:

- project to research information on local area
- direct observation of the candidate using local knowledge to answer customer questions
- oral or written questions to assess knowledge of local information and information sources
- role-play to provide information for variety of different customers
- review of portfolios of evidence and third party workplace reports of on-the-job performance by the candidate.

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THHGCS01B Develop and Update Local Knowledge

Key Competencies in this Unit

Key Competencies are an integral part of all workplace competencies. The table below describes those applicable to this unit. Trainers and assessors should ensure that they are addressed in training and assessment.

Level 1 = Perform Level 2 = Administer and Manage Level 3 = Design and Evaluate

Key Competencies	Level	Examples
Collecting, Organising and Analysing Information	1	Organising the enterprise's local information folder
Communicating Ideas and Information	1	Explaining the location of the nearest bus stop to a customer
Planning and Organising Activities	1	Contacting local attractions to request information brochures for display
Working with Others and in Teams	1	Assisting a colleague to answer a customer question
Using Mathematical Ideas and Techniques	1	Calculating the amount of time to reach a local attraction
Solving Problems	1	Helping a lost customer who speaks very little English
Using Technology	1	Using the phone or Internet to source information on the local area

THHGGA03B Source and present information

Unit Descriptor

This unit deals with the skills and knowledge required to conduct basic research and present information in response to an identified need. It covers typical situations found in tourism and hospitality workplaces where there is a need to research information for a specific workplace need. It does not cover the development and presentation of more complex or strategic reports.

Element	Performance Criteria
1 Find information	1.1 Identify a range of current and accurate information sources appropriate to the task.
	1.2 Access a range of information sources and assess for relevance and applicability.
	1.3 Obtain information within designated timelines.
2 Prepare and present information	2.1 Review information and select content to suit the specific need.
	2.2 Draft text if required, including all appropriate information.
	2.3 Express information within the draft text clearly, concisely and accurately.
	2.4 Present information according to enterprise guidelines, and in a format appropriate to the circumstances.
	2.5 Deliver information to the appropriate person within designated timelines.

Range Statement

This unit applies to hospitality and tourism enterprises. The following explanations identify how this unit may be applied in different workplaces, sectors and circumstances.

For generic pre-employment training and assessment, a range of industry contexts must be addressed. Where the focus is sector or workplace specific, training and assessment must be tailored to meet particular needs.

Information to be researched may include:

- information from product suppliers eg for sourcing a new supplier or product
- information from other departments in the enterprise (eg. about available products or services)
- customer service research eg getting feedback from customers about a particular product or service
- information on new workplace systems or equipment
- career or general industry information.

Sources of information may include:

- other colleagues and personnel
- product suppliers
- general and trade media (print and electronic)
- reference books
- Internet
- lectures and presentations
- trade shows and exhibitions
- customer feedback.

Information may be presented orally, in note form, or in simple report form.

Evidence Guide

Essential Knowledge and Skills to be Assessed

The following skills and knowledge must be assessed as part of this unit:

- basic research skills, encompassing:
 - identification of sources of information required (eg. Internet, industry journals)
 - questioning and active listening skills to elicit information
 - note-taking
 - sorting and processing information
- written and oral communication skills for conveying information clearly, concisely and coherently
- types of information resources available for a range of topics and how to access them
- organisational policies and procedures in regard to the presentation of information.

Linkages to Other Units

This unit has linkages to the following units and combined training and assessment may be appropriate:

- THHHCO04B Develop and update hospitality industry knowledge
- THTTCO01B Develop and update tourism industry knowledge

Critical Aspects of Assessment

Evidence of the following is critical:

- ability to find and review current and correct information on various topics related to the particular job role
- ability to present information in a logical, well-organised and appropriate manner.

Context of Assessment and Resource Implications

Assessment must ensure:

- industry-realistic timelines and conditions for completion of tasks.
- use of current information and data

Assessment Methods

Assessment methods must be chosen to ensure that researching and presenting information on a particular topic can be practically demonstrated. Methods must include assessment of knowledge as well as assessment of practical skills.

The following examples are appropriate for this unit:

- project to research a work-related topic and deliver the information sourced in a brief presentation
- simple report with recommendations on a prospective product to be purchased
- review of portfolios of evidence and third party workplace reports of on-the-job performance by the candidate.

Key Competencies in this Unit

Key Competencies are an integral part of all workplace competencies. The table below describes those applicable to this unit. Trainers and assessors should ensure that they are addressed in training and assessment.

Level 1 = Perform Level 2 = Administer and Manage Level 3 = Design and Evaluate

Key Competencies	Level	Examples
Collecting, Organising and Analysing Information	1	Researching information using a range of different sources Organising information researched into a logical order, or filing system
Communicating Ideas and Information	1	Presenting information clearly to various audiences Writing simple reports, making simple presentations
Planning and Organising Activities	1	Working out a schedule for research activities

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THHGGA03A Source and Present Information

Working with Others and in Teams	1	Asking questions of colleagues about a given topic
Using Mathematical Ideas and Techniques	1	May involve researching mathematical information such as prices and quantities Comparing prices, doing very simple statistical analysis
Solving Problems	1	Dealing with inability to find information, conflicting information
Using Technology	1	Using the Internet to access information

THTTCO01B Develop and update tourism industry knowledge

Unit Descriptor

This unit deals with the skills and knowledge required to develop and update knowledge of the tourism industry, including the role of different industry sectors and key legislation. This knowledge underpins effective performance in all sectors and applies to all people working in the tourism industry. In-depth knowledge is therefore not required.

Element

Performance Criteria

Seek information on the tourism industry

- | | |
|-----|--|
| 1.1 | Identify sources of information on the tourism industry correctly including information relating to: <ul style="list-style-type: none">economic and social significance of the tourism industry and the role of local communitiesdifferent tourism markets and their relevance to industry sectorsrelationships between tourism and other industriesdifferent sectors of the industry, their inter-relationships and the services available in each sectormajor tourism industry bodiesenvironmental issues for tourismindustrial relationsspecific features of the local/regional industrycareer opportunities within the industrythe roles and responsibilities of individual staff members in a successful tourism business including ethical practiceswork organisation and time managementquality assurancecurrent and emerging industry technology including e-business. |
| 1.2 | Access and update specific information on relevant sector(s) of work. |
| 1.3 | Access and use knowledge of the tourism industry in the correct context to enhance the quality of work performance. |

2	Source and apply information on legal and ethical issues which impact on the tourism industry	2.1	Obtain information on legal and ethical issues to assist effective work performance.
		2.2	Conduct day-to-day activities in accordance with legal obligations and ethical industry practices.
3	Update tourism industry knowledge	3.1	Identify and use a range of opportunities to update general knowledge of the tourism industry.
		3.2	Monitor current issues of concern to the industry.
		3.3	Share updated knowledge with customers and colleagues as appropriate, and incorporate into day-to-day work activities.

Range Statement

This unit applies to all sectors of the tourism industry.

Information sources and opportunities to update knowledge may include:

- media
- reference books
- libraries
- unions
- industry associations and organisations
- industry journals
- computer data, including Internet
- personal observations and experience
- industry seminars or training courses
- informal networking.

Legal issues which impact on the industry include:

- consumer protection
- duty of care
- equal employment opportunity
- anti-discrimination
- workplace relations.
- child sex tourism.

Metal and Engineering Training Package

THTTCO01B Develop and Upgrade Tourism Industry Knowledge

Ethical issues impacting on the industry may relate to:

- confidentiality
- commission procedures
- overbooking
- pricing
- tipping
- familiarisations
- gifts and services free of charge
- product recommendations.

Industries other than tourism may include:

- hospitality
- entertainment
- arts
- sports
- agriculture
- conservation
- science and research
- retail.

Environmental issues may include:

- protection of natural and cultural integrity
- minimal impact operations
- environmental sustainability
- waste management
- energy-efficient operations
- land ownership
- land access and usage.

Economic and social issues may include:

- employment
- effect on local amenities/facilities
- population change due to tourism development
- community role in tourism.

Issues of concern to the industry may be related to:

- government initiatives
- emerging markets
- environmental and social issues
- labour issues
- industry expansion or retraction.

Evidence Guide

Essential Knowledge and Skills to be Assessed

The following knowledge and skills must be assessed as part of this unit:

- different sectors of the tourism industry and their inter-relationships, including a general knowledge of the structure, roles and functions of the following sectors:

accommodation

attractions and theme parks

tour operators

tour wholesalers

retail travel agents

information services and co-ordination sector (local, regional, national)

meetings and events.

- major cross-industry and sector-specific organisations.
- overview of quality assurance in the tourism industry and the roles and responsibilities of individual staff members in quality assurance.
- overview of how to organise time and work in different industry contexts.
- tourism industry information sources.
- basic research skills:

identification of relevant information

questioning techniques to obtain information

sorting and summarising information.

- legislation (both State and Federal) which applies across the industry in the following areas (name, primary objective and impact on individual staff only):

consumer protection

duty of care

equal employment opportunity

anti-discrimination

workplace relations.

child sex tourism

- overview of current and emerging technology used across the tourism industry, including e-business.

Linkages to Other Units

This is a core unit that underpins effective performance in all other units and combined training and assessment may be appropriate.

Critical Aspects of Assessment

Evidence of the following is critical:

- ability to source industry information
- general knowledge of the tourism industry, including main roles, functions and inter-relationships of different sectors, with a more detailed knowledge of issues which relate to a specific sector or workplace.

Context of Assessment and Resource Implications

Assessment must ensure:

- project or work activities that allow the candidate to demonstrate the application of knowledge to specific tourism industry contexts and situations.

Assessment Methods

Assessment methods must be chosen to ensure that ability to develop and update knowledge can be practically demonstrated. Methods must include assessment of knowledge as well as assessment of practical skills.

The following examples are appropriate for this unit:

- case studies and problem-solving exercises to assess application of knowledge to different situations and contexts
- questions to assess knowledge of different aspects of the tourism industry
- review of portfolios of evidence and third party workplace reports of on-the-job performance by the candidate.

Key Competencies in this Unit

Key Competencies are an integral part of all workplace competencies. The table below describes those applicable to this unit. Trainers and assessors should ensure that they are addressed in training and assessment.

Level 1 = Perform Level 2 = Administer and Manage Level 3 = Design and Evaluate

Key Competencies	Level	Examples
Collecting, Organising and Analysing Information	2	Deciding whether to join an industry association based on promotional materials
Communicating Ideas and Information	1	Liaising with colleagues from other industry sectors to meet a particular customer request
Planning and Organising Activities	1	Organising a personal program of professional development activities for the upcoming year
Working with Others and in Teams	1	Discussing industry events with colleagues
Using Mathematical Ideas and Techniques	-	-
Solving Problems	1	Responding to a situation which involves dealing with a sector of the industry of which you have limited knowledge
Using Technology	1	Using the Internet to source information on the tourism industry

THTSMA01B

Coordinate the production of brochures and marketing materials

Unit Descriptor

This unit deals with the skills and knowledge required to coordinate the development of promotional brochures and other printed marketing materials. Sales and marketing personnel, managers or owners of small businesses generally undertake this role.

Element

Performance Criteria

- | | | |
|--|-----|---|
| 1 Plan the production of brochures and marketing materials | 1.1 | Plan production in accordance with enterprise objectives, marketing focus and other issues that impact on the production process. |
| | 1.2 | Create detailed action plans for the production process including timelines, responsibilities and budget. |
| 2 Produce information for inclusion | 2.1 | Produce or obtain from the appropriate source accurate and complete information for inclusion. |
| | 2.2 | Present information in a clear and easily understood format. |
| | 2.3 | Present information in a culturally appropriate way. |
| 3 Obtain quotations for artwork and printing as appropriate | 3.1 | Provide accurate and complete specifications to quoting organisations within appropriate timeframe. |
| | 3.2 | Obtain comprehensive quotations with full details of potential variations to cost and conditions that may apply. |

- | | | | |
|----------|---|-----|---|
| 4 | Develop final copy for brochures and marketing materials | 4.1 | Develop copy using basic creative writing techniques where appropriate to sell the products presented. |
| | | 4.2 | Produce copy that provides accurate practical and operational details. |
| | | 4.3 | Present all costs accurately with notes about conditions which may apply. |
| | | 4.4 | Present general conditions clearly and accurately according to enterprise policy. |
| | | 4.5 | Check all copy for accuracy prior to submission to external/internal arthouse or printers. |
| 5 | Coordinate the production of brochures and marketing materials | 5.1 | Liaise with production house or responsible staff member in a manner that permits accurate monitoring of production schedule. |
| | | 5.2 | Check and correct all production work as required. |
| | | 5.3 | Re-check and gain approval of appropriate authority only when totally accurate. |
| | | 5.4 | Approve artwork according to enterprise guidelines prior to commencement of printing. |
| | | 5.5 | Obtain and deliver brochures and marketing materials on schedule and establish contingency plans to allow for situations where timelines may be exceeded. |

Range Statement

This unit applies to all tourism and hospitality industry sectors. The following explanations identify how this unit may be applied in different workplaces, sectors and circumstances.

Actual production/printing may be conducted either in-house or by an external agency.

Brochures and marketing materials may include:

- product brochures
- destinational guides
- promotional flyers and leaflets
- conference programs/registration forms
- event prospectus
- display materials
- product support manuals
- advertising materials
- direct mail pieces
- invitations.

Factors that must be considered in the planning of brochures are:

- objectives of the material
- market for which material is required
- review of competitive materials
- style and size of material
- time parameters
- budget available
- in-house production capabilities
- distribution considerations - internal and external
- availability of required information
- any legal requirements or restrictions.

Information for inclusion may include:

- supplier information
- photos
- maps
- tariff details
- special offers or incentives
- advertisements
- sponsor messages
- logos.

Metal and Engineering Training Package

THTSMA01B Coordinate the Production of Brochures and Marketing Materials

Accurate and complete specifications must include:

- size
- number of colours
- type of paper
- number of photographs
- layout and style of text
- total number required
- conditions of contract
- production and delivery deadlines.

Evidence Guide

Essential Knowledge and Skills to be Assessed

The following knowledge and skills must be assessed as part of this unit:

- market context for the materials being produced, including general awareness of potential for use on websites
- print production processes and terminology including copy, film, artwork, 2-colour process, 4-colour process, final art, proofreading, bromide, print-ready, PDF file, author's corrections, transparencies
- printing and industry conventions in relation to placement of information, page numbering, copyright information
- quality indicators in brochure production including readability, photographic quality, effective use of colour, spacing requirements
- current production technology
- techniques used in brochure-writing
- procedures and requirements for preparation and proofing of copy
- legal issues that affect the production of printed materials as appropriate to individual sectors/workplaces including copyright laws.

Linkages to Other Units

There is a strong link between this unit and the following units and combined training and assessment may be appropriate:

- THHGCS07B Coordinate marketing activities

Critical Aspects of Assessment

Evidence of the following is critical:

- ability to co-ordinate all elements of the brochure development process within a required timeframe
- ability to produce materials that meet stated objectives, provide current and accurate information and are free of errors
- knowledge and understanding of current production processes and terminology.

Context of Assessment and Resource Implications

Assessment must ensure:

- the actual production of brochures and marketing materials to meet a specified market need
- access to technology and materials for the production of brochures and marketing materials.

For generic pre-employment training and assessment, a range of industry contexts must be addressed. Where the focus is sector or workplace specific, training and assessment must be tailored to meet particular needs.

Assessment Methods

Assessment methods must be chosen to ensure that brochure co-ordination and production skills can be practically demonstrated. Methods must include assessment of knowledge as well as assessment of practical skills.

The following examples are appropriate for this unit:

- evaluation of brochures or other marketing materials produced by the candidate
- oral or written questions to assess knowledge of brochure co-ordination and production processes
- review of portfolios of evidence and third party workplace reports of on-the-job performance by the candidate.

Key Competencies in this Unit

Key Competencies are an integral part of all workplace competencies. The table below describes those applicable to this unit. Trainers and assessors should ensure that they are addressed in training and assessment.

Level 1 = Perform Level 2 = Administer and Manage Level 3 = Design and Evaluate

Key Competencies	Level	Examples
Collecting, Organising and Analysing Information	3	Gathering and preparing data from multiple suppliers for a touring brochure
Communicating Ideas and Information	3	Writing copy for a destination brochure aimed at the youth market
Planning and Organising Activities	3	Co-ordinating the print production process
Working with Others and in Teams	2	Negotiating with printers in relation to print costs
Using Mathematical Ideas and Techniques	1	Calculating total costs of production
Solving Problems	2	Dealing with a situation where print production will not be completed until after the date of a major promotional show
Using Technology	1	Using the editing function within 'Word' to edit brochure copy

WRRCA1B

OPERATE RETAIL EQUIPMENT

This unit involves the skills, knowledge and attitudes to operate of a variety of retail equipment. It involves identifying the correct equipment required for a given task, maintaining retail equipment, applying keyboard skills and operating data entry equipment.

ELEMENTS OF COMPETENCY	PERFORMANCE CRITERIA
1 Maintain retail equipment	<p>1.1 Purpose of equipment used in store/department identified accurately.</p> <p>1.2 Equipment operated according to design specifications.</p> <p>1.3 Equipment faults identified and reported to appropriate personnel.</p> <p>1.4 Maintenance program for retail equipment identified and applied according to store policy.</p>
2 Apply keyboard skills	<p>2.1 Keyboard operated using typing techniques within designated speed and accuracy requirements.</p> <p>2.2 Information entered and edited accurately.</p>
3 Operate data entry equipment	<p>3.1 Data entered using relevant equipment according to store policy and procedures.</p> <p>3.2 Price marking equipment operated according to manufacturer's instructions and store policy.</p> <p>3.3 Data entered accurately and within designated time limits.</p>

RANGE OF VARIABLES

The Range of Variables provide the range of applications of this unit of competency to allow for differences within enterprises and workplaces. It provides details of practices, knowledge and requirements referred to in the elements and performance criteria. The variables chosen in training and assessment will depend on the work contexts.

The following variables may include but are not limited to:

- Store policies and procedures in regard to:
 - store administration
 - clerical systems
- Retail equipment may include:
 - point of sales terminals
 - electronic bar coding equipment for price labelling and stocktaking
 - portable data entry
 - printers
 - electronic ordering equipment
 - wrapping and packing equipment such as shrink wrapping
 - equipment for carrying or moving merchandise
 - equipment for storage of merchandise including refrigerators
 - weighing machines
 - thermometers
 - dye tag removers
 - trolley return equipment
 - computers
 - scanners
 - numerical keyboard equipment including calculators
- Appropriate personnel may include:
 - supervisor
 - team leader
 - manager

EVIDENCE GUIDE

The following components of the evidence guide relate directly to the performance criteria and the range of variables for the unit of competency and provide guidance for assessment of the unit in the workplace and/or training program.

Critical Aspects of Evidence

Competency in this unit requires evidence that the candidate:

- Operates a range of store retail equipment according to store policy and procedures and industry codes of practice.
- Operates and maintains a range of store retail equipment according to manufacturers' instructions and design specifications.
- Applies store maintenance program and reports faults/problems.
- Consistently applies safe work practices, in the operation and maintenance of store retail equipment, according to occupational health and safety legislation/regulations/ codes of practice.
- Reads and interprets operation manuals to solve routine faults/errors and maintains and uses the equipment effectively.
- Uses keyboard skills to enter and edit data accurately.
- Completes tasks in set time frame.

Underpinning Skills and Knowledge

Knowledge and skills are essential to apply this unit in the workplace, to transfer to other contexts and deal with unplanned events. The requirements for this unit of competency are listed below:

Knowledge of:

- Store policies and procedures, in regard to:
 - the operation of store retail equipment
 - maintenance of store retail equipment
 - reporting problems and faults
- Relevant legislation and statutory requirements
- Relevant occupational health and safety regulations
- Relevant industry codes of practice
- Purpose and impact of using electronic technology
- Operation and maintenance of store retail equipment
- Licensing requirements for carrying/moving merchandise (if applicable)

Skills in:

- Completing tasks in set time frame
- Dealing with different types of transactions
- Following common fault finding procedures
- Operation and use of store retail equipment
- Literacy and numeracy skills in regard to:
 - reading store procedures for
 - operating equipment

Generic Process Skills

There are a number of processes that are learnt throughout work and life which are required in all jobs. They are fundamental processes and generally transferable to other work functions. Some of these are covered by the **key competencies**, although others may be added. The questions below highlight how these processes are applied in this unit of competency. Following each question a number indicates the level to which the key competency needs to be demonstrated where 0 = not required, 1 = perform the process, 2 = perform and administer the process, and 3 = perform, administer and design the process.

Key Competency	Example of Application	Performance Level
How can communication of ideas and information be applied?	Reporting equipment faults to appropriate personnel will require the communication of ideas and information.	1
How can information be collected, analysed and organised ?	Maintaining retail equipment according to store policy will require information to be collected, analysed and organised.	1
How are activities planned and organised ?	Entering and editing information will require activities to be planned and organised.	1
How can team work be applied?	Team work will be applied when reporting to other staff members.	1
How can the use of mathematical ideas and techniques be applied?	Entering data will require the use of mathematical ideas and techniques.	1
How can problem solving skills be applied?	Maintaining equipment and identifying faults will require problem solving skills.	1
How can the use of technology be applied?	The use of technology will be applied when operating retail equipment.	1

Context of Assessment

Assessment Process

For valid and reliable assessment of this unit, evidence should be gathered through a range of methods to indicate consistent performance.

It can be gathered from assessment of the unit of competency alone, through an integrated assessment activity or through a combination of both.

Evidence should be gathered as part of the learning process.

Integrated Competency Assessment

Evidence is most relevant when provided through an integrated activity which combines the elements of competency for each unit, or a cluster of units of competency.

The candidate will be required to:

- Apply knowledge and skills which underpin the process required to demonstrate competence, including appropriate key competencies.
- Integrate knowledge and skills critical to demonstrating competence in this unit.

Unit WRRCA1B can be assessed with other units which make up a particular job function.

Evidence Gathering Methods

Evidence should include products, processes and procedures from the workplace context or from a simulated work environment. Evidence might include:

- Observation of the person in the workplace
- A simulated role play
- Third party reports from a supervisor
- Customer feedback
- Answers to questions about specific skills and knowledge

Resources Required

- A real or simulated work environment
- Relevant documentation, such as:
 - store policy and procedure manuals
 - manufacturer's instructions/operation manuals
- A range of store retail equipment

WRRCA5B

OPERATE RETAIL INFORMATION TECHNOLOGY SYSTEMS

This unit encompasses the competencies required to use and apply store information technology systems in a retail environment. It involves demonstrating knowledge of the hardware and software in use, editing and updating information and solving problems in relation to equipment/hardware/software.

ELEMENTS OF COMPETENCY	PERFORMANCE CRITERIA
1 Use store information technology system	<ul style="list-style-type: none">1.1 Knowledge of store information technology system accurately demonstrated and conveyed to other staff members as required.1.2 Hardware accurately identified and operated according to manufacturer's instructions and store procedures.1.3 Software accurately identified and used according to manufacturer's instructions and store procedures.1.4 Application and uses of software available, accurately identified and used according to store procedures.1.5 Data transmitted according to Electronic Data Interchange procedures as required.1.6 Keyboard skills used accurately to enter information as required by store policies.1.7 Back up procedures regularly performed according to store procedures.
2 Edit/update information	<ul style="list-style-type: none">2.1 Information to be edited/updated correctly identified according to store procedures.2.2 Information on system accurately edited/updated according to store procedures.2.3 Price changes accurately identified and entered into store system as required.2.4 Matching of shelf data price and computer records ensured.
3 Solve problems	<ul style="list-style-type: none">3.1 Equipment/hardware/software faults identified and rectified where possible or expert assistance sought without delay.3.2 Maintenance program for hardware and software systems monitored and implemented according to manufacturer's specifications and store procedures.3.3 Routine problems handled using appropriate problem solving techniques and referred to appropriate personnel as required.3.4 Problems arising at point of sale evaluated and resolved according to store procedures.3.5 Assistance positively and actively provided to staff as

Metal and Engineering Training Package

WRRCA5B Operate Retail Information Technology Systems

problems arise.

RANGE OF VARIABLES

The Range of Variables provide the range of applications of this unit of competency to allow for differences within enterprises and workplaces. It provides details of practices, knowledge and requirements referred to in the elements and performance criteria. The variables chosen in training and assessment will depend on the work contexts.

The following variables may include but are not limited to:

- Store policy and procedures in regard to:
 - information technology systems
- Types of equipment used may include:
 - personal computers/terminals which may be stand alone or networked
 - scanning equipment
 - bar coding
 - point of sale terminals
 - pricing equipment
- Software may include:
 - menus
 - word processing
 - databases
 - electronic data interchange (E.D.I.)
- Systems used may include:
 - centrally based
 - store based
 - networked
- Applications and use of information technology systems may include:
 - point of sale operations
 - EFTPOS
 - credit cards
 - smart cards
 - loyalty cards
 - fly buys
 - credit checks granting of credit, loans
 - arrangement of credit for customer via a third party
 - customer details, records
 - financial details
 - pricing, price changes
 - store specials, suppliers deals (direct to store)
 - inventory control/stock losses
 - ordering of stock
 - stock transfers
 - staff productivity, scanning rates, sales volume
 - staff payroll (from staff log in and log out)

RANGE OF VARIABLES (CONTINUED)

- staff rosters
- sales reports
- individual/department/item sales performances
- profitability of lines/items
- Information to be entered may include:
 - price changes (manually or electronically)
 - staffing information
 - customer details/records including names, addresses, consumer information/profiles
 - stock records
 - stock transfers
 - orders
- Stock ordering/selling may include:
 - electronic cataloguing
 - use of multi-media
 - selling from computer screen
 - electronic data interchange (E.D.I.)
 - delivery management
 - use of internet facilities
 - suppliers using shopping pages to communicate information direct to customer
- System problems may relate to:
 - hardware faults, breakdowns
 - software

Metal and Engineering Training Package

WRRCA5B Operate Retail Information Technology Systems

- staff abilities/training
- point of sale, eg. EFTPOS, credit facilities, cheque clearances
- pricing variations
- Problems may be solved by:
 - routine procedures
 - manufacturers recommendations
 - lateral thinking
 - operator or manager
 - referral to specialist/expert
- Back up procedures may include:
 - zip drives
 - CD ROM
 - digital tape
 - floppy discs
- Relevant personnel may include:
 - store/area manager
 - supervisor
 - team leader
 - technical specialist

EVIDENCE GUIDE

The following components of the evidence guide relate directly to the performance criteria and the range of variables for the unit of competency and provide guidance for assessment of the unit in the workplace and/or training program.

Critical Aspects of Evidence

Competency in this unit requires evidence that the candidate:

- Consistently applies store policies and procedures in regard to information technology systems including:
 - resolution of system faults
 - use and application of store credit and EFTPOS
 - reviewing and entering information on store system.
- Follows requirements of relevant legislation and statutory requirements including consumer law and credit procedures.

Underpinning Skills and Knowledge

Knowledge and skills are essential to apply this unit in the workplace, to transfer to other contexts and deal with unplanned events. The requirements for this unit of competency are listed below:

Knowledge of:

- Store policies and procedures, in regard to use and operation of store information technology systems including:
 - use and maintenance of hardware and software systems
 - solutions to problems/breakdowns
 - operation of equipment
- Relevant legislation and statutory requirements including:
 - consumer law
 - credit procedures
 - occupational health and safety
- Relevant industry codes of practice
- Store product and services range, including pricing structure
- Manufacturer specifications in regard to operation of hardware and software
- Software licensing specifications
- Techniques for problem solving

Skills in:

- Using store technology information systems
- Application and use of hardware and software
- Interpersonal communication skills
- Literacy and numeracy skills in regard to:
 - processing, recording and documenting information

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EVIDENCE GUIDE (CONTINUED)**Generic Process Skills**

There are a number of processes that are learnt throughout work and life which are required in all jobs. They are fundamental processes and generally transferable to other work functions. Some of these are covered by the **key competencies**, although others may be added. The questions below highlight how these processes are applied in this unit of competency. Following each question a number indicates the level to which the key competency needs to be demonstrated where 0 = not required, 1 = perform the process, 2 = perform and administer the process, and 3 = perform, administer and design the process.

Key Competency	Example of Application	Performance Level
How can communication of ideas and information be applied?	Knowledge of store information technology systems will need to be conveyed to others.	2
How can information be collected, analysed and organised ?	Information on hardware and software will need to be collected, analysed and organised.	2
How are activities planned and organised ?	Editing and updating information requires activities to be planned and organised.	2
How can team work be applied?	Team work will be applied when demonstrating information to others.	2
How can the use of mathematical ideas and techniques be applied?	Mathematical ideas and techniques may be required when using specific software packages.	2
How can problem solving skills be applied?	Problem solving skills will be applied when identifying problems at point of sale and establishing a suitable resolution.	2
How can the use of technology be applied?	The use of technology will be applied throughout this unit.	2

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EVIDENCE GUIDE (CONTINUED)

Context of Assessment

Assessment Process

For valid and reliable assessment of this unit, evidence should be gathered through a range of methods to indicate consistent performance.

It can be gathered from assessment of the unit of competency alone, through an integrated assessment activity or through a combination of both.

Evidence should be gathered as part of the learning process.

Integrated Competency Assessment

Evidence is most relevant when provided through an integrated activity which combines the elements of competency for each unit, or a cluster of units of competency.

The candidate will be required to:

- Apply knowledge and skills which underpin the process required to demonstrate competence, including appropriate key competencies.
- Integrate knowledge and skills critical to demonstrating competence in this unit.

Unit WRRCA5B can be assessed with other units which make up a particular job function.

Evidence gathering methods

Evidence should include products, processes and procedures from the workplace context or from a simulated work environment. Evidence might include:

- Observation of the person in the workplace
- A simulated role play
- Third party reports from a supervisor
- Customer feedback
- Answers to questions about specific skills and knowledge

Resources Required

- A real or simulated work environment
- Hardware and software instruction manuals
- Information technology system
- Relevant documentation, such as:
 - store/sample policies and procedures on management of information technology systems
 - legislation and statutory requirements
 - occupational health and safety requirements
 - industry codes of practice

WRRCS2B

APPLY POINT OF SALE HANDLING PROCEDURES

This unit encompasses the skills, knowledge and attitudes required at the point of sale in any retail store. It includes operating the point of sale equipment, applying store policies and procedures to a range of transactions, dealing appropriately with the customer and packing or wrapping the item for transportation.

ELEMENTS OF COMPETENCY

PERFORMANCE CRITERIA

1 Operate point of sale equipment

- 1.1 Point of sale equipment operated according to design specifications.
- 1.2 Point of sale terminal opened and closed according to store procedure.
- 1.3 Point of sale terminal cleared and tender transferred according to store procedure.
- 1.4 Cash handled according to store security procedures.

1.5

Sup

plies of change in point of sale terminal maintained according to store policy.

- 1.6 Active point of sale terminals attended according to store policy.
- 1.7 Records completed for transaction errors according to store policy.
- 1.8 Adequate supplies of dockets, vouchers and point of sale documents maintained.
- 1.9 Customers informed of delays in the point of sales operation.

2 Perform point of sale transactions

- 2.1 Point of sale transactions completed according to store policy.
- 2.2 Store procedures identified and applied in respect of cash and non-cash transactions.
- 2.3 Store procedures identified and applied in regard to exchanges and returns.
- 2.4 Goods moved through point of sale area efficiently and with attention to fragility and packaging.

ELEMENTS OF COMPETENCY

PERFORMANCE CRITERIA

- | | | |
|----------|----------------------------|--|
| | 2.5 | Information entered into point of sale equipment accurately. |
| | 2.6 | Price/total/amount of cash received stated verbally to customer. |
| | 2.7 | Correct change tendered. |
| 3 | Complete sales | |
| | 3.1 | Customer order forms, invoices, receipts completed accurately. |
| | 3.2 | Customer delivery requirements identified and processed accurately, without undue delay. |
| | 3.3 | Sales transactions processed without undue delay or customers directed to point of sale terminals according to store policy. |
| 4 | Wrap and pack goods | |
| | 4.1 | Adequate supplies of wrapping material or bags maintained/requested. |
| | 4.2 | Appropriate packaging material selected. |
| | 4.3 | Merchandise wrapped neatly and effectively where required. |
| | 4.4 | Items packed safely to avoid damage in transit, and labels attached where required. |
| | 4.5 | Transfer of merchandise for parcel pick-up or other delivery methods arranged if required. |

RANGE OF VARIABLES

The Range of Variables provide the range of applications of this unit of competency to allow for differences within enterprises and workplaces. It provides details of practices, knowledge and requirements referred to in the elements and performance criteria. The variables chosen in training and assessment will depend on the work contexts.

The following variables may include but are not limited to:

- Store policies and procedures in regard to:
 - operation of point of sale equipment
 - security
 - sales transactions
 - handling techniques of stock
- Point of sale equipment may include:
 - cash registers
 - cash drawers
 - scanners
- Customer interactions may include:
 - greetings
 - price confirmation
 - delivery inquiries
 - reward point inquiries
 - regular and new customers
 - routine or special requirements
- Transactions may include:
 - EFTPOS
 - cheques
 - Travellers cheques
 - credit cards/store cards
 - smart cards
 - lay-by
 - returns
 - exchanges
 - gift vouchers
- Packing and wrapping materials may include:
 - boxes
 - bags
 - paper
 - bubble wrap
 - gift wrapping
- Staff may include:
 - full time
 - casual
 - part time

EVIDENCE GUIDE

The following components of the evidence guide relate directly to the performance criteria and the range of variables for the unit of competency and provide guidance for assessment of the unit in the workplace and/or training program.

Critical Aspects of Evidence

Competency in this unit requires evidence that the candidate:

- Consistently operates point of sale equipment according to manufacturer's instructions and store policies and procedures.
- Consistently applies store policies and procedures in regard to cash handling and point of sale transactions.
- Processes sales transaction information responsibly and accurately according to store policies and procedures.
- Constantly applies store policies and procedures in regard to the handling, packing and wrapping of goods/merchandise.

Underpinning Skills and Knowledge

Knowledge and skills are essential to apply this unit in the workplace, to transfer to other contexts and deal with unplanned events. The requirements for this unit of competency are listed below:

Knowledge of:

- Store policies and procedures in relation to:
 - customer service
 - point of sale transactions
 - allocated duties and responsibilities
 - exchanges and returns
 - handling, packing and wrapping of goods/merchandise
- The range of services provided by the store
- Stock availability
- Relevant legislation and statutory requirements including:
 - Trade Practices Act
 - consumer law
 - industry codes of practice
 - occupational health and safety
- Cash and non-cash handling procedures including:
 - opening and closing point of sale terminal
 - clearance of terminal and transference of tender
 - maintenance of cash float
 - tendering of change
 - counting cash
 - calculating non-cash documents
 - balancing point of sale equipment
 - recording takings
 - security of cash and non cash transactions
 - change required and denominations of change

EVIDENCE GUIDE (CONTINUED)

- Functions and procedures for operating point of sale equipment including:
 - registers
 - numerical display board
 - calculators
 - electronic scales
 - scanners

Skills in:

- Following set routines and procedures
- Verbal and non verbal communication
- Questioning and active listening
- Dealing with different types of transactions
- Wrapping and packing techniques
- Store bag checking procedures
- Merchandise handling techniques
- Literacy skills in regard to written sales and delivery documentation
- Numeracy skills in regard to rendering change

Generic Process Skills

There are a number of processes that are learnt throughout work and life which are required in all jobs. They are fundamental processes and generally transferable to other work functions. Some of these are covered by the **key competencies**, although others may be added. The questions below highlight how these processes are applied in this unit of competency. Following each question a number indicates the level to which the key competency needs to be demonstrated where 0 = not required, 1 = perform the process, 2 = perform and administer the process, and 3 = perform, administer and design the process.

Key Competency	Example of Application	Performance Level
How can communication of ideas and information be applied?	By communicating with the customer in relation to the amount owed and identifying delivery requirements.	1
How can information be collected, analysed and organised ?	By identifying customer requirements in relation to picking up parcels or having them delivered and to where.	1
How are activities planned and organised ?	By organising the wrapping and packaging of goods and maintaining adequate supplies.	1
How can team work be applied?	This skill may not be applicable to this unit.	0
How can the use of mathematical ideas and techniques be applied?	Mathematical ideas and techniques need to be used when receiving money from customer and in giving correct change.	1

Metal and Engineering Training Package

WRRCS2B Apply Point of Sale Handling Procedures

How can problem solving skills be applied?	Organising delivery and packaging goods will require problem solving skills.	1
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EVIDENCE GUIDE (CONTINUED)

How can the use of technology be applied?	Using various point of sale equipment requires the use of technology.	1
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Context of Assessment

Assessment Process

For valid and reliable assessment of this unit, evidence should be gathered through a range of methods to indicate consistent performance.

It can be gathered from assessment of the unit of competency alone, through an integrated assessment activity or through a combination of both.

Evidence should be gathered as part of the learning process.

Integrated Competency Assessment

Evidence is most relevant when provided through an integrated activity which combines the elements of competency for each unit, or a cluster of units of competency.

The candidate will be required to:

- Apply knowledge and skills which underpin the process required to demonstrate competence, including appropriate key competencies.
- Integrate knowledge and skills critical to demonstrating competence in this unit.

Unit WRRCS2B can be assessed with the following units:

- WRRLP2B Minimise theft
- WRRCS3B Interact with customers
- WRI1B Perform stock control procedures
- WRRF1B Balance the register/terminal

Evidence Gathering Methods

Evidence should include products, processes and procedures from the workplace context or from a simulated work environment. Evidence might include:

- Observation of the person in the workplace
- A simulated role play
- Third party reports from a supervisor
- Customer feedback
- Answers to questions about specific skills and knowledge

Resources Required

- A real or simulated work environment
- Relevant documentation, such as:
 - stock/inventory/price lists
 - financial transaction dockets/slips
 - lay by/credit/product return slips
 - store policy and procedures manuals
- A range of point of sale equipment

WRRCS3B

INTERACT WITH CUSTOMERS

This unit encompasses the skills, knowledge and attitudes required to deliver service to customers. It entails being able to communicate effectively with customers, respond to their complaints, receive and process sales orders and identify customers special requirements.

ELEMENTS OF COMPETENCY

PERFORMANCE CRITERIA

1 Deliver service to customers

- 1.1 Communication with customers conducted in a professional, courteous manner, according to store policy.
- 1.2 Customer needs and reasonable requests met or referred to supervisor according to store policy or legislative requirements.
- 1.3 Customer details and information recorded where necessary.
- 1.4 Possible problems identified, anticipated and action taken to minimise the effect on customer satisfaction.
- 1.5 Opportunities to deliver additional levels of service beyond the customer's immediate request recognised and acted upon.
- 1.6 Contact with customer maintained until sale is completed according to store policy.
- 1.7 Customer farewelled appropriately and courteously according to store policy.
- 1.8 Verbal and non-verbal communication used to develop rapport with customers during service delivery.
- 1.9 Repeat customers encouraged by promotion of appropriate services or products according to store policy.
- 1.10 Customer returns or refunds processed according to store policy and procedures.

ELEMENTS OF COMPETENCY	PERFORMANCE CRITERIA
2 Respond to customer complaints	<ul style="list-style-type: none">2.1 Positive helpful attitude conveyed to customers when handling complaints.2.2 Complaints handled sensitively, courteously and with discretion.2.3 Nature of complaint established by active listening and questioning and confirmed with the customer.2.4 Action taken to resolve complaint to customers' satisfaction wherever possible.2.5 Unresolved customer dissatisfaction or complaints promptly referred to supervisor.2.6 Opportunities taken to turn incidents of customer dissatisfaction into a demonstration of high quality service to customers in line with store policy.2.7 Documentation regarding customer dissatisfaction or complaints completed accurately and legibly.2.8 Follow up action taken as necessary to ensure customer satisfaction.
3 Receive and process sales orders	<ul style="list-style-type: none">3.1 Customers' details and information recorded accurately.3.2 Customers promptly referred to appropriate area as required.3.3 Customers provided with information in clear, concise manner.3.4 Sales orders processed, recorded and acted upon according to store policy.
4 Identify customers special requirements	<ul style="list-style-type: none">4.1 Customers with special needs or requirements identified promptly by observation and questioning.4.2 A willingness to assist conveyed verbally and non-verbally.4.3 Customers' needs promptly serviced, referred or redirected as required.

RANGE OF VARIABLES

The Range of Variables provide the range of applications of this unit of competency to allow for differences within enterprises and workplaces. It provides details of practices, knowledge and requirements referred to in the elements and performance criteria. The variables chosen in training and assessment will depend on the work contexts.

The following variables may include but are not limited to:

- Store policies and procedures in regard to:
 - customer service
 - dealing with customer complaints
 - processing sales orders
- Customers may include:
 - regular and new customers
 - people from a range of social, cultural, ethnic backgrounds and physical and mental abilities
 - people with a routine or special requests
- Sales orders may be in:
 - verbal
 - written
 - electronic form
- Legislative requirements may include:
 - Trade Practices Act
 - tobacco laws
 - lottery acts
 - liquor licensing regulations
 - sale of X and R rated products
 - sale of second hand goods
 - trading hours
 - transport, storage and handling of goods
 - sale of X and R rated products
- Customer service may include:
 - all store activities
 - internal and external customers
 - follow up in event of delays in service provision
- Customer needs may include:
 - information regarding store facilities and services
 - location of specific items within the store
 - returns or refunds

EVIDENCE GUIDE

The following components of the evidence guide relate directly to the performance criteria and the range of variables for the unit of competency and provide guidance for assessment of the unit in the workplace and/or training program.

Critical Aspects of Evidence

Competency in this unit requires evidence that the candidate:

- Consistently applies store policies and procedures and industry codes of practice in regard to customer service.
- Provides a quality service environment by treating customers and team members in a courteous and professional manner through all stages of the service/sales procedure.
- Accurately identifies the nature of customer complaints, resolves complaints and provides service to customers according to store policies.
- Uses effective questioning/active listening and observation skills to identify customers' special requirements.
- Accesses, records and processes sales orders accurately and responsibly according to store policies and procedures.
- Collaboratively works within a team to meet customers' needs.

Underpinning Skills and Knowledge

Knowledge and skills are essential to apply this unit in the workplace, to transfer to other contexts and deal with unplanned events. The requirements for this unit of competency are listed below:

Knowledge of:

- Store policies and procedures, in regard to:
 - customer service
 - dealing with difficult customers
 - handling and recording complaints
 - allocated duties and responsibilities
 - customer returns and refunds
 - lay by/gift voucher/rain check procedures
- Merchandise and service range of store departments
- Location of store departments
- Functions and procedures for operating the store telephone system and other communication equipment and the relevant numbers
- Relevant legislation and statutory requirements
- Relevant industry codes of practice
- Relevant occupational health and safety requirements
- Questioning/active listening
- Conflict resolution
- Following set routines and procedures
- Handling difficult or abusive customers

EVIDENCE GUIDE (CONTINUED)

Skills in:

- Greeting/farewelling techniques
- Add on selling concepts
- Literacy skills in the following areas:
 - written procedures for orders, in person, by telephone or electric format
 - message taking in person or by telephone
 - written record of complaints
 - sales, stock and delivery documentation
- Numeracy skills in regard to:
 - handling of tender
 - weighing and measuring goods

Generic Process Skills

There are a number of processes that are learnt throughout work and life which are required in all jobs. They are fundamental processes and generally transferable to other work functions. Some of these are covered by the **key competencies**, although others may be added. The questions below highlight how these processes are applied in this unit of competency. Following each question a number indicates the level to which the key competency needs to be demonstrated where 0 = not required, 1 = perform the process, 2 = perform and administer the process, and 3 = perform, administer and design the process.

Key Competency	Example of Application	Performance Level
How can communication of ideas and information be applied?	Delivering service to customers requires ideas and information to be communicated.	1
How can information be collected, analysed and organised ?	Dealing with customer complaints requires information to be collected, analysed and organised.	1
How are activities planned and organised ?	Receiving and processing sales orders requires activities to be planned and organised.	1
How can team work be applied?	Referring customers to relevant personnel will require team work to be applied.	1
How can the use of mathematical ideas and techniques be applied?	Processing sales orders will require the use of mathematical ideas and techniques.	1
How can problem solving skills be applied?	Dealing with customer complaints will require problem solving skills.	1
How can the use of technology be applied?	The use of technology may not be required in this unit.	0

EVIDENCE GUIDE (CONTINUED)

Context of Assessment

Assessment Process

For valid and reliable assessment of this unit, evidence should be gathered through a range of methods to indicate consistent performance.

It can be gathered from assessment of the unit of competency alone, through an integrated assessment activity or through a combination of both.

Evidence should be gathered as part of the learning process.

Integrated Competency Assessment

Evidence is most relevant when provided through an integrated activity which combines the elements of competency for each unit, or a cluster of units of competency.

The candidate will be required to

- Apply knowledge and skills which underpin the process required to demonstrate competence, including appropriate key competencies.
- Integrate knowledge and skills critical to demonstrating competence in this unit.

Unit WRRCS3B can be assessed with the following units:

WRRCS2B Apply point of sale handling procedures

WRRLP1B Minimise theft

WRR11B Perform stock control procedures

WRRF1B Balance the register/terminal

Evidence Gathering Methods

Evidence should include products, processes and procedures from the workplace context or from a simulated work environment. Evidence might include:

- Observation of the person in the workplace
- A simulated role play
- Third party reports from a supervisor
- Customer feedback
- Answers to questions about specific skills and knowledge

Resources Required

- A real or simulated work environment
- Relevant documentation, such as:
 - sales order forms
 - complaint/return forms
 - stock/inventory/price lists
 - store policy and procedures manuals
- Access to a range of customers with different requirements
- Point of sale equipment and materials
- A communication system or a range of communication equipment

WRRF1B

BALANCE REGISTER/TERMINAL

This unit encompasses the skills, knowledge and attitudes required to balance the register/terminal in a retail environment. It involves clearing the register, counting money, calculating non-cash transactions and reconciling takings.

ELEMENTS OF COMPETENCY

PERFORMANCE CRITERIA

1 Remove takings from register/terminal

- 1.1 Register/terminal balance performed at designated times according to store policy and procedures.
- 1.2 Cash float separated from takings prior to balancing procedure and secured according to store policy.
- 1.3 Change supplied to register/terminal according to store policy.
- 1.4 Register/terminal reading or print out accurately determined.
- 1.5 Cash and non-cash documents removed and transported according to store security policies and procedures.

2 Reconcile takings

- 2.1 Cash counted accurately.
- 2.2 Non-cash documents calculated accurately.
- 2.3 Balance between register/terminal reading and sum of cash and non-cash transactions determined accurately.
- 2.4 Records for store and individual department takings recorded accurately and according to store policy.

RANGE OF VARIABLES

The Range of Variables provide the range of applications of this unit of competency to allow for differences within enterprises and workplaces. It provides details of practices, knowledge and requirements referred to in the elements and performance criteria. The variables chosen in training and assessment will depend on the work contexts.

The following variables may include but are not limited to:

- Store policies and procedures in regard to:
 - register/terminal balance
 - security
- Register/terminals may be:
 - manual
 - electronic
- Non-cash transactions may include:
 - credit cards
 - cheques
 - hire purchase
 - lay-by
 - cash on delivery (C.O.D.)
 - customer refunds
 - customer credit ratings
- Register/terminals may be cleared by:
 - operator
 - specialist staff
 - at intervals during or at close of trading

EVIDENCE GUIDE

The following components of the evidence guide relate directly to the performance criteria and the range of variables for the unit of competency and provide guidance for assessment of the unit in the workplace and/or training program.

Critical Aspects of Evidence

Competency in this unit requires evidence that the candidate:

- Operates register/terminal equipment according to manufacturers' instructions and store policy.
- Consistently applies store policies and procedures in regard to handling cash and removing takings from register/terminal.
- Consistently applies store policies and procedures in regard to reading registers and recording information.
- Processes documentation/records responsibly and according to store policies and procedures.
- Reconciles takings according to store policies and procedures.

EVIDENCE GUIDE (CONTINUED)

Underpinning Skills and Knowledge

Knowledge and skills are essential to apply this unit in the workplace, to transfer to other contexts and deal with unplanned events. The requirements for this unit of competency are listed below:

Knowledge of:

- Store policies and procedures, in regard to:
 - register/terminal balance
 - cash and non-cash transactions security
 - cash float
 - operation of equipment used at register/terminal
- Cash and non-cash handling procedures, including:
 - opening and closing point of sale terminal
 - clearance of terminal and transference of tender
 - maintenance of cash float
 - counting cash
 - calculating non-cash documents
 - balancing point of sale terminal
 - recording takings
 - security of cash and non-cash transactions
 - change required and denominations of change
 - EFTPOS/credit cards
 - gift vouchers/lay by
 - credit and returns

Skills in:

- Completing tasks in a set time frame
- Literacy skills in regard to interpreting documentation
- Numeracy skills in regard to:
 - counting cash
 - calculating non-cash transactions
 - reporting on takings

Generic Process Skills

There are a number of processes that are learnt throughout work and life which are required in all jobs. They are fundamental processes and generally transferable to other work functions. Some of these are covered by the **key competencies**, although others may be added. The questions below highlight how these processes are applied in this unit of competency. Following each question a number indicates the level to which the key competency needs to be demonstrated where 0 = not required, 1 = perform the process, 2 = perform and administer the process, and 3 = perform, administer and design the process.

Key Competency	Example of Application	Performance Level
How can communication of ideas and information be applied?	Errors in readings may need to be communicated to relevant personnel.	1

How can information be collected, analysed and organised ?	Counting cash and non-cash documents and balancing readings requires information to be collected, analysed and organised.	1
How are activities planned and organised ?	Reconciling takings requires activities to be planned and organised.	1
How can team work be applied?	Team work may be required when establishing individual and store department takings.	1
How can the use of mathematical ideas and techniques be applied?	Mathematical ideas and techniques will be required when balancing register/terminal.	1
How can problem solving skills be applied?	Problem solving skills will be applied when balancing register/terminal reading and sum of cash and non-cash transactions.	1
How can the use of technology be applied?	The use of technology will be applied through using the register/terminal.	1

Context of Assessment

Assessment Process

For valid and reliable assessment of this unit, evidence should be gathered through a range of methods to indicate consistent performance.

It can be gathered from assessment of the unit of competency alone, through an integrated assessment activity or through a combination of both.

Evidence should be gathered as part of the learning process.

EVIDENCE GUIDE (CONTINUED)

Integrated Competency Assessment

Evidence is most relevant when provided through an integrated activity which combines the elements of competency for each unit, or a cluster of units of competency.

The candidate will be required to:

- Apply knowledge and skills which underpin the process required to demonstrate competence, including appropriate key competencies.
- Integrate knowledge and skills critical to demonstrating competence in this unit.

Unit WRRF1B can be assessed with the following units:

WRRCS2B Apply point of sale handling procedures

WRRLP2B Minimise theft

WRRCS3B Interact with customers

WRR11B Perform stock control procedures

Evidence Gathering Methods

Evidence should include products, processes and procedures from the workplace context or from a simulated work environment. Evidence might include:

- Observation of the person in the workplace
- A simulated role play
- Third party reports from a supervisor
- Customer feedback
- Answers to questions about specific skills and knowledge

Resources Required

- A real or simulated work environment
- Relevant documentation, such as:
 - financial transaction dockets/slips/invoices
 - sample debit, credit card vouchers
 - recording/tally sheets
 - store policy and procedure manuals in regard to register/terminal balance
- Register/terminal and related equipment

WRRF2B

PERFORM RETAIL FINANCE DUTIES

This unit encompasses the skills, knowledge and attitudes required to perform retail finance duties. It involves processing petty cash and non-cash transactions, preparing banking documents, reconciling invoices for payment and preparing invoices for debtors.

ELEMENTS OF COMPETENCY	PERFORMANCE CRITERIA
1 Process petty cash transactions	<ul style="list-style-type: none">1.1 Petty cash claims checked for approval, accuracy and authenticity before processing.1.2 Transactions balanced and checked according to store policy and procedures.1.3 Irregularities noted and referred to relevant personnel for resolution.1.4 Petty cash transactions processed and recorded within designated time limits.
2 Prepare banking documents	<ul style="list-style-type: none">2.1 Cashbook entries balanced against record of takings.2.2 Deposit entries accurately compiled and balanced.2.3 Cash and non-cash transactions listed on banking deposit forms in accordance with the banking institution's guidelines.2.4 In-store credit systems processed according to store policy.
3 Process non-cash transactions	<ul style="list-style-type: none">3.1 Credit card transactions balanced and presented to relevant personnel for checking.3.2 Irregularities noted and referred to relevant personnel for resolution.

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ELEMENTS OF COMPETENCY

PERFORMANCE CRITERIA

4 Reconcile invoices for payment to creditors

- 4.1 Discrepancies between invoices and delivery and delivery notes identified and reported to relevant personnel/section for resolution.
- 4.2 Errors in invoice charges identified and reported to relevant personnel/section for correction/resolution.
- 4.3 Discrepancies and errors rectified, as directed.
- 4.4 Corrected and authorised invoices processed for payment within designated time limits.
- 4.5 Creditor inquiries resolved and/or referred to relevant personnel/section for resolution.

5 Prepare invoices for debtors

- 5.1 Preparatory calculations performed to produce accurate customer invoices.
- 5.2 Relevant documentation completed to ensure accuracy of contents.
- 5.3 Documents distributed to relevant personnel/section for certification prior to being dispatched.
- 5.4 Verified documents dispatched within designated time limits.
- 5.5 Documents copied and filed for auditing purposes.

RANGE OF VARIABLES

The Range of Variables provide the range of applications of this unit of competency to allow for differences within enterprises and workplaces. It provides details of practices, knowledge and requirements referred to in the elements and performance criteria. The variables chosen in training and assessment will depend on the work contexts.

The following variables may include but are not limited to:

- Store policies and procedures in regard to:
 - store financial systems
- Financial recording systems may be:
 - manual
 - electronic
- Business source documents used may include:
 - purchase requisitions
 - purchase orders
 - invoices
 - receipts
 - delivery dockets/receipts
 - credit notes
 - statements
 - remittance advices
 - cash register rolls
 - deposit books
- Non-cash transactions may include:
 - credit cards
 - customer credit ratings
 - cheques
 - hire purchase
 - lay-by
 - cash on delivery (C.O.D.)
 - customer refunds
- Relevant personnel may include:
 - manager
 - supervisor
 - team leader

EVIDENCE GUIDE

The following components of the evidence guide relate directly to the performance criteria and the range of variables for the unit of competency and provide guidance for assessment of the unit in the workplace and/or training program.

Critical Aspects of Evidence

Competency in this unit requires evidence that the candidate:

- Consistently applies store policies and procedures, in regard to petty cash and non-cash transactions, invoicing, banking processes and processing delivery and document discrepancies.
- Consistently and responsibly applies skills pertaining to the reconciliation and payments of invoices for creditors and debtors, in accordance with store policies and procedures.

Underpinning Skills and Knowledge

Knowledge and skills are essential to apply this unit in the workplace, to transfer to other contexts and deal with unplanned events. The requirements for this unit of competency are listed below:

Knowledge of:

- Store policies and procedures in regard to:
 - register/terminal balance
 - cash and non-cash transactions security
 - petty cash
 - cash balances
 - banking procedures
 - purchase requisitions/orders
 - issuing of receipts
 - delivery dockets
 - credit notes
 - statements
 - remittance advices
 - cash register rolls
 - deposit books
 - change required and denomination of change
 - operation of equipment used at register/terminal
 - processing delivery and delivery document discrepancies
 - invoicing procedures for debtors and creditors
- Payment/invoice procedures including Goods and Services Tax (GST) requirements
- Cash and non-cash handling procedures, including:
 - opening and closing point of sale terminal
 - clearance of terminal and transference of tender
 - maintenance of cash balances
 - counting cash
 - calculating non-cash documents
 - customer credit ratings
 - balancing point of sale terminal
 - recording takings
 - security of cash and non-cash transactions
 - change required and denominations of change

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EVIDENCE GUIDE (CONTINUED)

- EFTPOS/credit cards
- processing of cheques
- gift vouchers/lay by
- cash on delivery (COD)
- lay-by
- credits and returns
- customer refunds

Skills in:

- Completing tasks in set timeframes
- Literacy skills in regard to interpreting documentation
- Numeracy skills in regard to:
 - processing petty cash transactions
 - balancing cashbook entries and takings

Generic Process Skills

There are a number of processes that are learnt throughout work and life which are required in all jobs. They are fundamental processes and generally transferable to other work functions. Some of these are covered by the **key competencies**, although others may be added. The questions below highlight how these processes are applied in this unit of competency. Following each question a number indicates the level to which the key competency needs to be demonstrated where 0 = not required, 1 = perform the process, 2 = perform and administer the process, and 3 = perform, administer and design the process.

Key Competency	Example of Application	Performance Level
How can communication of ideas and information be applied?	Irregularities in petty cash transactions need to be referred to relevant personnel for resolution.	1
How can information be collected, analysed and organised ?	Preparing banking documents requires information to be collected, analysed and organised.	1
How are activities planned and organised ?	Processing petty cash transactions requires activities to be planned and organised.	1
How can team work be applied?	Team work may be required when referring irregularities to others.	1
How can the use of mathematical ideas and techniques be applied?	Mathematical ideas and techniques will be applied when processing petty cash transactions.	1
How can problem solving skills be applied?	Problem solving skills will be applied when identifying discrepancies between invoices and delivery.	1

Metal and Engineering Training Package

WRRF2B Perform Retail Finance Duties

How can the use of technology be applied?	The use of technology will be applied when processing in-store credit systems.	1
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EVIDENCE GUIDE (CONTINUED)

Context of Assessment

Assessment Process

For valid and reliable assessment of this unit, evidence should be gathered through a range of methods to indicate consistent performance.

It can be gathered from assessment of the unit of competency alone, through an integrated assessment activity or through a combination of both.

Evidence should be gathered as part of the learning process.

Integrated Competency Assessment

Evidence is most relevant when provided through an integrated activity which combines the elements of competency for each unit, or a cluster of units of competency.

The candidate will be required to:

- Apply knowledge and skills which underpin the process required to demonstrate competence, including appropriate key competencies.
- Integrate knowledge and skills critical to demonstrating competence in this unit.

Unit WRRF2B can be assessed with the following units:

WRRCA2B Apply retail office procedures

WRRCA3B Apply retail office keyboard skills

Evidence Gathering Methods

Evidence should include products, processes and procedures from the workplace context or from a simulated work environment. Evidence might include:

- Observation of the person in the workplace
- A simulated role play
- Third party reports from a supervisor
- Customer feedback
- Answers to questions about specific skills and knowledge

Resources Required

- A real or simulated work environment
- Relevant documentation, such as:
 - store policy and procedures manuals
 - financial transaction dockets/slips/invoices
 - banking deposit forms
- EFTPOS facilities and equipment
- Registers and related equipment

WRI1B

PERFORM STOCK CONTROL PROCEDURES

This unit encompasses the skills, knowledge and attitudes required to handle stock in a retail environment. It involves receiving and processing incoming goods, rotating stock, participating in stocktakes, reordering stock and dispatching goods.

ELEMENTS OF COMPETENCY

PERFORMANCE CRITERIA

1 Receive and process incoming goods

- 1.1 Cleanliness and orderliness in receiving bay maintained according to store policy.
- 1.2 Goods unpacked using correct techniques and equipment in line with store policy.
- 1.3 Packing materials removed and disposed of promptly according to store policy.
- 1.4 Incoming stock accurately checked and validated against purchase orders and delivery documentation according to store policy.
- 1.5 Items received inspected for damage, quality, use-by dates, breakage or discrepancies and recorded according to store policy.
- 1.6 Stock levels accurately recorded on store stock systems, according to store policy.
- 1.7 Secure storage of goods arranged according to store policy and legislative requirements.
- 1.8 Stock dispatched to appropriate area/department.
- 1.9 Stock price and code labels applied when required according to store policy.

2 Rotate stock

- 2.1 Stock rotation procedures for merchandise and wrapping and packing materials carried out routinely and accurately according to store policy.
- 2.2 Excess stock placed in storage or disposed of in accordance with store policy and legislative requirements.
- 2.3 Safe lifting and carrying techniques maintained in line with store occupational health and safety policy and legislative requirements.

ELEMENTS OF COMPETENCY	PERFORMANCE CRITERIA
3 Participate in stocktake	<p>3.1 Stocktaking and cyclical counts assisted with, according to store policy/procedures.</p> <p>3.2 Stock records documentation completed according to store stock control system.</p> <p>3.3 Discrepancies in stock recorded and reported to relevant personnel.</p> <p>3.4 Electronic recording equipment operated and maintained according to manufacturer's specifications.</p>
4 Reorder stock	<p>4.1 Minimum stock levels identified according to store policy.</p> <p>4.2 Stock requisition forms or electronic orders completed accurately.</p> <p>4.3 Undelivered stock orders identified on stock system and followed up without undue delay.</p>
5 Dispatch goods	<p>5.1 Goods to be returned to supplier identified and labelled with date, supplier and reason for return or referred to management if required.</p> <p>5.2 Credit request documentation completed according to store procedure.</p> <p>5.3 Goods stored securely while awaiting dispatch.</p> <p>5.4 Delivery documentation completed according to store procedures.</p> <p>5.5 Special delivery instructions noted.</p> <p>5.6 Items packed safely and securely to avoid damage in transit.</p>

RANGE OF VARIABLES

The Range of Variables provide the range of applications of this unit of competency to allow for differences within enterprises and workplaces. It provides details of practices, knowledge and requirements referred to in the elements and performance criteria. The variables chosen in training and assessment will depend on the work contexts.

The following variables may include but are not limited to:

- Store policy and procedures in regard to:
 - stock control
 - dispatch
- Stock recording may be:
 - manual
 - electronic
- Stocktakes may be:
 - cyclical
 - compliance driven
- Store stock control may include:
 - checking incoming or existing stock
 - special orders
- Stock may be moved:
 - manually
 - mechanically
- Handling techniques may vary according to:
 - stock characteristics
 - industry codes of practice
- Reporting of faults may involve:
 - telephone
 - fax
 - email
 - letter
 - face to face
- Legislative requirements may include:
 - occupational health and safety
 - hazardous substances and dangerous goods
 - labelling of workplace substances
 - waste removal and environmental protection
 - transport, storage and handling of goods
- Relevant personnel may include:
 - team leader
 - supervisor
 - store/area manager

EVIDENCE GUIDE

The following components of the evidence guide relate directly to the performance criteria and the range of variables for the unit of competency and provide guidance for assessment of the unit in the workplace and/or training program.

Critical Aspects of Evidence

Competency in this unit requires evidence that the candidate:

- Consistently applies store policies and procedures, industry codes of practice, relevant legislation and statutory requirements in regard to stock control.
- Consistently applies safe work practices in the manual handling and moving of stock, according to occupational health and safety legislation/regulations/codes of practice.
- Interprets and applies manufacturers' instructions with regard to handling stock and using relevant equipment.
- Receives and processes incoming goods and dispatches outgoing goods according to store policies and procedures.
- Rotates stock and reorders stock/maintains stock levels according to store policies and procedures.
- Assists with stocktaking and cyclical counts according to store policies and procedures.
- Interprets and processes information accurately and responsibly.

Underpinning Skills and Knowledge

Knowledge and skills are essential to apply this unit in the workplace, to transfer to other contexts and deal with unplanned events. The requirements for this unit of competency are listed on the following page:

Knowledge of:

- Store policies and procedures, in regard to:
 - stock control
 - store labelling policy
 - product quality standards
 - correct unpacking of goods
 - out of date, missing or damaged stock
 - equipment used
 - stock location
 - waste disposal
 - methods of storage
 - delivery documentation
 - stock record documentation
 - dispatch documentation
- Reporting faults and problems
- Relevant legislation and statutory requirements
- Relevant industry codes of practice
- Relevant occupational health and safety regulations

Skills in:

- Following set routine and procedures
- Using electronic labelling/ticketing equipment
- Literacy and numeracy skills in regard to:
 - stock records and delivery documentation

EVIDENCE GUIDE (CONTINUED)

Generic Process Skills

There are a number of processes that are learnt throughout work and life which are required in all jobs. They are fundamental processes and generally transferable to other work functions. Some of these are covered by the **key competencies**, although others may be added. The questions below highlight how these processes are applied in this unit of competency. Following each question a number indicates the level to which the key competency needs to be demonstrated where 0 = not required, 1 = perform the process, 2 = perform and administer the process, and 3 = perform, administer and design the process.

Key Competency	Example of Application	Performance Level
How can communication of ideas and information be applied?	Reordering stock may require ideas and information to be communicated.	1
How can information be collected, analysed and organised ?	Maintaining stock levels, receiving and processing incoming goods will require information to be collected, analysed and organised.	1
How are activities planned and organised ?	Identifying stock levels and reordering requires activities to be planned and organised.	1
How can team work be applied?	Team work may be applied when undertaking stocktake procedures.	1
How can the use of mathematical ideas and techniques be applied?	Mathematical ideas and techniques may be required when receiving goods and checking and validating delivery.	1
How can problem solving skills be applied?	Problem solving skills may be applied when identifying excess stock and determining storage or return of items.	1
How can the use of technology be applied?	The use of technology may be applied when recording stock and reporting faults and problems.	1

Context of Assessment

Assessment Process

For valid and reliable assessment of this unit, evidence should be gathered through a range of methods to indicate consistent performance.

It can be gathered from assessment of the unit of competency alone, through an integrated assessment activity or through a combination of both.

Evidence should be gathered as part of the learning process.

Metal and Engineering Training Package

WRR11B Perform Stock Control Procedures

EVIDENCE GUIDE (CONTINUED)

Integrated Competency Assessment

Evidence is most relevant when provided through an integrated activity which combines the elements of competency for each unit, or a cluster of units of competency.

The candidate will be required to:

- Apply knowledge and skills which underpin the process required to demonstrate competence, including appropriate key competencies.
- Integrate knowledge and skills critical to demonstrating competence in this unit.

Unit WRR11B can be assessed with the following units:

WRRCS2B Apply point of sale handling techniques

WRRLP2B Minimise theft

WRRCS3B Interact with customers

WRRF1B Balance the register/terminal

Evidence Gathering Methods

Evidence should include products, processes and procedures from the workplace context. Evidence might include:

- Observation of the person in the workplace
- Third party reports from a supervisor
- Customer feedback
- Answers to questions about specific skills and knowledge

Resources Required

- A retail work environment
- Access to relevant equipment including
 - stock moving equipment
 - manual and electronic labelling/ticketing equipment
 - computers/stock recording equipment
- Relevant documentation, such as:
 - invoices/packing slips/dispatch documents/order forms
 - recording/tally sheets
 - store policy and procedures manuals
 - occupational health and safety regulations
 - legislation and statutory requirements
 - industry codes of practice

WRR15A

MAINTAIN AND ORDER STOCK

This unit encompasses the competencies required to maintain and order stock in a retail environment. It involves monitoring receipt and dispatch of goods, maintaining stock records, coordinating stocktake, identifying stock losses, processing orders and following up on orders.

ELEMENTS OF COMPETENCY

PERFORMANCE CRITERIA

1 Monitor receipt and dispatch of goods

- 1.1 Responsibility for receipt and dispatch of goods delegated to appropriate staff.
- 1.2 Store procedures implemented in regard to receipt, dispatch and secure storage of goods.
- 1.3 Staff functions observed to ensure store procedures are followed and documentation is completed correctly.
- 1.4 Store procedures implemented to ensure goods inspected for quantity and quality on receipt.
- 1.5 Variations to quantity and quality of delivered goods acted upon according to store policy.
- 1.6 Safe handling and storage of goods supervised in line with store policy.

2 Maintain stock records

- 2.1 Stock levels monitored and maintained at required levels.
- 2.2 Stock reorder cycles maintained, monitored and adjusted as required.
- 2.3 Team members informed of their individual responsibilities in regard to recording of stock.
- 2.4 Stock storage and movement records maintained in line with store policy.
- 2.5 Stock discrepancies recorded and procedures followed according to store policy.
- 2.6 Stock performance monitored and fast/slow selling items identified and reported according to store policy.

ELEMENTS OF COMPETENCY

PERFORMANCE CRITERIA

3 Coordinate stocktake/cyclical count

- 3.1 Policies and procedures in regard to stocktaking and cyclical counts interpreted and explained to team members.
- 3.2 Staff rostered according to allocated budget and time constraints.
- 3.3 Stocktaking tasks allocated to individual team members.
- 3.4 Team members provided with clear directions for the performance of each task.
- 3.5 Team members allocated to ensure effective use of staff resources to complete task.
- 3.6 Accurate reports on stocktake data, including discrepancies produced for management.

4 Identify stock losses

- 4.1 Losses accurately identified, recorded and assessed against potential loss forecast on a regular basis.
- 4.2 Avoidable losses identified and reasons established.
- 4.3 Possible solutions recommended and implemented.

5 Process order

- 5.1 Orders for stock processed/raised as requested according to store policies and procedures.
- 5.2 Ordering and recording system accurately maintained.
- 5.3 Availability of sample range ensured according to buying plan.
- 5.4 Pricing materials ordered as required.
- 5.5 Negotiated purchase and supply agreements recorded accurately and filed for retrieval.

6 Follow up order

- 6.1 Delivery process monitored to meet agreed deadlines.
- 6.2 Routine supply problems handled or referred to management as required by store policy.
- 6.3 Continuous liaison with buyers, store/departments, warehouse and suppliers to

ensure continuity of supply.

6.4 Stock distributed according to store/department allocation.

RANGE OF VARIABLES

The Range of Variables provide the range of applications of this unit of competency to allow for differences within enterprises and workplaces. It provides details of practices, knowledge and requirements referred to in the elements and performance criteria. The variables chosen in training and assessment will depend on the work contexts.

The following variables may include but are not limited to:

- Store policy and procedures in regard to:
 - Stock control
 - stock control system
 - recording procedures
 - procedures for investigating discrepancies
 - store merchandise and marketing
 - pricing, labelling and packaging requirements
 - quality control policies and procedures
- Ordering and recording systems may be:
 - Manual
 - electronic
- Stock transfers may involve:
 - inter and intra store/department
- Suppliers may include:
 - existing contacts
 - new contacts
 - local suppliers
 - overseas supplies
- Reporting of faults may be achieved by:
 - fax
 - telephone
 - email
 - letter
 - verbally
- Handling techniques may vary according to:
 - stock characteristics
 - industry codes of practice

Metal and Engineering Training Package

WRR15A Maintain and Control Stock

- Staff rostering requirements may include:
 - varying levels of staff training
 - staffing levels
 - routine or busy trading conditions
 - full time, part time or casual staff
 - range of staff responsibilities
- Reports for management may include:
 - financial reports
 - business documents
 - informal reports
 - stocktake reports

EVIDENCE GUIDE

The following components of the evidence guide relate directly to the performance criteria and the range of variables for the unit of competency and provide guidance for assessment of the unit in the workplace and/or training program.

Critical Aspects of Evidence

Competency in this unit requires evidence that the candidate:

- Consistently implements and monitors store policy/procedures regarding receipt, dispatch and secure storage of goods.
- Regularly monitors staff implementation of store procedures and documentation in regard to receipt, dispatch and secure storage of goods.
- Monitors stock levels, storage, movement and reorder cycles on a regular basis.
- Organises and coordinates stock take, according to store policy and procedures.
- Consistently raises/processes stock orders and maintains record system according to store policies and procedures.
- Monitors delivery processes and distributes stock to ensure continuity of supply.

Underpinning Skills and Knowledge

Knowledge and skills are essential to apply this unit in the workplace, to transfer to other contexts and deal with unplanned events. The requirements for this unit of competency are listed below:

Knowledge of:

- Store policies and procedures, in regard to:
 - stock control
 - store merchandising system
 - current and future stock levels
 - bar codes
 - labels
 - price tags
 - store stock recording system
 - stock replenishment/reorder procedures
 - inter and intra store/department transfers
 - reporting of stock discrepancies/damage
 - identifying and recording stock losses
 - identifying and recording discrepancies
 - existing suppliers
 - quality control procedures and requirements
 - receipt and dispatch of goods including inspection for quality and quantity
- Relevant licensing requirements for moving stock mechanically
- Relevant legislation and statutory requirements
- Relevant industry codes of practice
- Relevant occupational health and safety legislation/regulations/codes of practice
- Principles and techniques for interpersonal communication skills

EVIDENCE GUIDE (CONTINUED)

Skills in:

- Store stocktaking systems
- Use of electronic recording equipment
- Interpersonal communication skills
- Time management
- Negotiation skills
- Report preparation and presentation
- Literacy and numeracy skills in regard to:
 - stock control reports and documentation
 - processing orders
 - maintaining delivery and supply records
 - stock distribution records
 - maintaining stock ordering and recording systems

Generic Process Skills

There are a number of processes that are learnt throughout work and life which are required in all jobs. They are fundamental processes and generally transferable to other work functions. Some of these are covered by the **key competencies**, although others may be added. The questions below highlight how these processes are applied in this unit of competency. Following each question a number indicates the level to which the key competency needs to be demonstrated where 0 = not required, 1 = perform the process, 2 = perform and administer the process, and 3 = perform, administer and design the process.

Key Competency	Example of Application	Performance Level
How can communication of ideas and information be applied?	By informing staff of relevant roles and responsibilities for monitoring and ordering stock.	2
How can information be collected, analysed and organised ?	Monitoring stock levels and processing orders will require information to be collected, analysed and organised.	2
How are activities planned and organised ?	By implementing procedures for receipting, dispatching and storing goods.	2
How can team work be applied?	Directing and allocating team members in particular roles and responsibilities requires team work.	2
How can the use of mathematical ideas and techniques be applied?	Processing orders and maintaining stock levels requires the use of mathematical ideas and techniques.	2
How can problem solving skills be applied?	Assessing stock losses and developing solutions requires problem solving skills.	2

Metal and Engineering Training Package

WRR15A Maintain and Control Stock

How can the use of technology be applied?	Ordering and recording stock requires the use of technology.	2
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EVIDENCE GUIDE (CONTINUED)

Context of Assessment

Assessment Process

For valid and reliable assessment of this unit, evidence should be gathered through a range of methods to indicate consistent performance.

It can be gathered from assessment of the unit of competency alone, through an integrated assessment activity or through a combination of both.

Evidence should be gathered as part of the learning process.

Integrated Competency Assessment

Evidence is most relevant when provided through an integrated activity which combines the elements of competency for each unit, or a cluster of units of competency.

The candidate will be required to:

- Apply knowledge and skills which underpin the process required to demonstrate competence, including appropriate key competencies.
- Integrate knowledge and skills critical to demonstrating competence in this unit.

Unit WRR15A can be assessed with other units which make up a specific job function.

Evidence Gathering Methods

Evidence should include products, processes and procedures from the workplace context. Evidence might include:

- Observation of the person in the workplace
- Third party reports from a supervisor
- Customer feedback
- Answers to questions about specific skills and knowledge

Resources Required

- A retail work environment
- Relevant documentation, such as:
 - store policy and procedures for receipt and dispatch of goods
 - store procedures for stocktake
 - occupational health and safety legislation/regulations/codes of practice
 - industry codes of practice
 - legislation and statutory requirements
 - store merchandising and marketing policy and procedures
 - inter and intra store/department transfer procedures
 - store quality control procedures and requirements

WRRLP1B

APPLY SAFE WORKING PRACTICES

This unit incorporates the National Occupational Health and Safety Commission (NOHSC) guidelines for occupational health and safety. It encompasses the skills, knowledge and attitudes to maintain a safe work environment for staff, customers and others. It involves observing basic safety and emergency procedures.

ELEMENTS OF COMPETENCY

PERFORMANCE CRITERIA

1 Observe basic safety procedures

- 1.1 Procedures to achieve a safe working environment followed and maintained in accordance with all relevant occupational health and safety legislation, including codes of practice, relating to particular hazards in the workplace or industry.
- 1.2 Unsafe work practices, including faulty equipment and plant are followed and reported according to store policy.
- 1.3 Dangerous goods and substances managed in accordance with store policy and relevant State and Territory legislation.
- 1.4 Tasks identified for potential manual risks and managed according to store policy.
- 1.5 Reporting of work related incidents and accidents to designated personnel observed.
- 1.6 Consultative processes for occupational health and safety demonstrated and procedures followed.

2 Observe basic emergency procedures

- 2.1 Fire and emergency procedures, including store evacuation, are followed in accordance with store policy and relevant State and Territory legislation.
- 2.2 Designated personnel responsible for first aid and evacuation procedures identified correctly.
- 2.3 Safety alarms identified accurately.

RANGE OF VARIABLES

The Range of Variables provide the range of applications of this unit of competency to allow for differences within enterprises and workplaces. It provides details of practices, knowledge and requirements referred to in the elements and performance criteria. The variables chosen in training and assessment will depend on the work contexts.

The following variables may include but are not limited to:

- Store policies and procedures in regard to:
 - observing basic safety procedures
 - observing emergency procedures
- Safety procedures may include:
 - hazard identification eg workplace inspections
 - fire or store evacuation involving staff or customers
 - emergency, fire and accident procedures
 - personal safety procedures
 - procedures for the use of personal protective clothing and equipment
 - issue resolution procedures
 - reporting incidents and accidents in the workplace
- Occupational health and safety procedures may deal with:
 - safe manual handling and lifting
 - dangerous goods
 - customers
 - staff
 - equipment/tools
 - premises
 - stock
- Emergency procedures may include:
 - sickness
 - accidents
 - fire
 - storms/cyclones
 - store evacuation
 - armed hold up
- Unsafe situations may deal with but are not restricted to:
 - sharp cutting tools and instruments
 - electricity and water
 - damaged packing material or containers
 - toxic substances
 - inflammable materials and fire hazards
 - lifting practices
 - spillages
 - waste and debris
 - ladders

- trolleys
- broken or damaged equipment
- glue guns/burns

RANGE OF VARIABLES

- Designated personnel may include:
 - safety representative
 - supervisor/team leader
 - manager
- Checking plant and equipment may include:
 - guarding of machinery
 - sharp cutting tools and instruments
 - broken or damaged equipment
 - damaged packing material or containers
- Safe manual handling practices may include:
 - lifting practices
 - use of equipment such as ladders, trolleys
 - job procedures
- Communication and consultation processes may include:
 - minutes from staff meetings, occupational health and safety meetings
 - identification of health and safety representatives
 - suggestions from staff for improving existing tasks and procedures

EVIDENCE GUIDE

The following components of the evidence guide relate directly to the performance criteria and the range of variables for the unit of competency and provide guidance for assessment of the unit in the workplace and/or training program.

Critical Aspects of Evidence

Competency in this unit requires evidence that the candidate:

- Consistently applies safe work practices, in all areas of the store, according to occupational health and safety legislation/regulations/codes of practice.
- Consistently applies store policies and procedures in regard to following basic safety procedures and for reporting faults/problems to relevant person/department/committee.
- Identifies hazardous situations and rectifies where appropriate, or reports to the relevant personnel according to store policy and procedures.
- Reads, accurately interprets and consistently applies manufacturers' instructions for storage and use of hazardous goods.
- Knows store policies and procedures with regard to emergency situations, evacuation or accident/illness in the store.

Underpinning Skills and Knowledge

Knowledge and skills are essential to apply this unit in the workplace, to transfer to other contexts and deal with unplanned events. The requirements for this unit of competency are listed below:

Knowledge of:

- Store policies and procedures, in regard to:
 - occupational health and safety and emergency procedures, which will take into account where applicable, State and Territory legislation and regulations
 - rights and responsibilities of designated personnel responsible for health and safety in the workplace
- Relevant industry codes of practice
- Management of occupational health and safety in the workplace including:
 - communication and consultation processes
 - reporting procedures
 - manual handling procedures
 - interpreting symbols for occupational health and safety signage
- First aid procedures
- Identification what hazards exist in the workplace including:
 - managing broken or of faulty equipment
 - storage of dangerous goods and hazardous substances
 - fire/chemical/electrical hazards
 - spills/leakage of materials
 - appropriate waste disposal
 - slips/trips/falls

- Controlling risks through the 'hierarchy of control' including:
 - eliminating hazards
 - isolating hazards
 - use of engineering controls
 - use of administrative controls
 - appropriate use of personal protective clothing

EVIDENCE GUIDE (CONTINUED)

Skills in:

- Locating and using safety alarms/fire extinguishers/emergency exits
- Identifying hazardous goods and substances
- Interpreting symbols used for occupational health and safety signage
- Storing and using chemicals and hazardous substances
- Handling broken or damaged equipment
- Manual handling procedures
- Using personal protective gear/equipment
- Appropriate waste disposal
- Literacy skills in regard to:
 - reading and interpreting instructions
- Numeracy skills in regard to:
 - estimating weights, size, quantities and mixtures

Generic Process Skills

There are a number of processes that are learnt throughout work and life which are required in all jobs. They are fundamental processes and generally transferable to other work functions. Some of these are covered by the **key competencies**, although others may be added. The questions below highlight how these processes are applied in this unit of competency. Following each question a number indicates the level to which the key competency needs to be demonstrated where 0 = not required, 1 = perform the process, 2 = perform and administer the process, and 3 = perform, administer and design the process.

Key Competency	Example of Application	Performance Level
How can communication of ideas and information be applied?	Reporting unsafe situations requires communication of ideas and information.	1
How can information be collected, analysed and organised ?	Information on fire and safety hazards needs to be collected, analysed and organised.	1
How are activities planned and organised ?	Identifying evacuation procedures requires planning and organisation.	1
How can team work be applied?	Team work will be applied when maintaining a safe work environment for staff, customers and others.	1
How can the use of mathematical ideas and techniques be applied?	Mathematical ideas and techniques may be applied when estimating weights, size, quantities and mixtures.	1
How can problem solving skills be applied?	Problem solving skills will be applied when identifying correct procedures for accidents or illness.	1

How can the use of technology be applied?	The use of technology may not be required in this unit.	0
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EVIDENCE GUIDE (CONTINUED)

Context of Assessment

Assessment Process

For valid and reliable assessment of this unit, evidence should be gathered through a range of methods to indicate consistent performance.

It can be gathered from assessment of the unit of competency alone, through an integrated assessment activity or through a combination of both.

Evidence should be gathered as part of the learning process.

Integrated Competency Assessment

Evidence is most relevant when provided through an integrated activity which combines the elements of competency for each unit, or a cluster of units of competency.

The candidate will be required to:

- Apply knowledge and skills which underpin the process required to demonstrate competence, including appropriate key competencies.
- Integrate knowledge and skills critical to demonstrating competence in this unit.

Unit WRRLP1B can be assessed with the following units:

WRRCS1B	Communicate in the workplace
WRRER1B	Work effectively in a retail environment
WRRM2B	Perform routine housekeeping duties
WRRCA1B	Operate retail equipment

Evidence Gathering Methods

Evidence should include products, processes and procedures from the workplace context or from a simulated work environment. Evidence might include:

- Observation of the person in the workplace
- A simulated role play
- Third party reports from a supervisor
- Customer feedback
- Answers to questions about specific skills and knowledge

EVIDENCE GUIDE (CONTINUED)

Resources Required

- A real or simulated work environment
- Suitable equipment and materials for lifting
- Relevant documentation, such as:
 - store policy and procedures manuals
 - manufacturer's instructions/operation manuals
 - occupational health and safety regulations
 - legislation and statutory requirements
 - industry codes of practice

WRRLP2B

MINIMISE THEFT

This unit encompasses the competencies required to minimise theft in a retail environment. It involves applying routine store security, taking appropriate action to minimise theft and maintaining security of cash, registers/terminals and keys.

ELEMENTS OF COMPETENCY

PERFORMANCE CRITERIA

1 Apply routine store security

- 1.1 Store security systems and procedures applied according to store policy.
- 1.2 Cash handled and secured according to store policy.
- 1.3 Suspect behaviour by customers observed and dealt with according to store policy.
- 1.4 Internal and external theft dealt with according to store policy.
- 1.5 Products and equipment stored in a secure manner.

2 Minimise theft

- 2.1 Appropriate action taken to minimise theft by applying store procedures.
- 2.2 Merchandise matched to correct price tags.
- 2.3 Surveillance of merchandise maintained according to store policy and legislative requirements.
- 2.4 Customers' bags checked as required at point of sale according to store policy and legislative requirements.
- 2.5 Security of cash, cash register and keys maintained according to store policy.
- 2.6 Security of stock, cash and equipment in regard to customers, staff and outside contractors maintained according to store policy.
- 2.7 Suspected or potential thieves dealt with according to store policy and procedures.

RANGE OF VARIABLES

The Range of Variables provide the range of applications of this unit of competency to allow for differences within enterprises and workplaces. It provides details of practices, knowledge and requirements referred to in the elements and performance criteria. The variables chosen in training and assessment will depend on the work contexts.

The following variables may include but are not limited to:

- Store policies and procedures in regard to:
 - security
 - surveillance of merchandise
- Security procedures may deal with:
 - customers
 - staff
 - keys
 - visitors, sales representatives, contractors, vendors
 - stock
 - records
 - cash, credit cards
 - equipment
 - premises
 - armed hold-up
- Security equipment may include:
 - alarm systems
 - video surveillance
 - mirrors
 - locked and secure areas
- Legal requirements may include:
 - privacy/confidentiality laws
 - Trade Practices and Fair Trading Acts
 - consumer law
 - property offences
 - credit laws
 - reporting procedures
 - criminal law

EVIDENCE GUIDE

The following components of the evidence guide relate directly to the performance criteria and the range of variables for the unit of competency and provide guidance for assessment of the unit in the workplace and/or training program.

Critical Aspects of Evidence

Competency in this unit requires evidence that the candidate:

- Consistently applies store policies and procedures and industry codes of practice, in regard to store security and theft prevention in a range of contexts and situations.
- Consistently applies store policies and procedures in regard to following security procedures and for reporting theft/suspicious behaviour to relevant personnel.
- Monitors stock, work area, customers and staff to minimise opportunities for theft.

Underpinning Skills and Knowledge

Knowledge and skills are essential to apply this unit of competency in the workplace, to transfer to other contexts and deal with unplanned events. The requirements for this unit of competency are listed below:

Knowledge of:

- Store policies and procedures, in regard to:
 - security
 - checking customers' bags and purchases
 - reporting problems and faults
- Relevant legislation and statutory requirements, particularly in regard to checking customers' bags and purchases
- Trade Practices and Fair Trading Acts
- Store merchandising system
- Security procedures relating to cash and non-cash transactions
- Location and operation of store security equipment
- Reporting procedures for external/internal theft or suspicious circumstances

Skills in:

- Literacy and numeracy skills in:
 - recording of stolen items
 - reporting of theft

EVIDENCE GUIDE (CONTINUED)**Generic Process Skills**

There are a number of processes that are learnt throughout work and life which are required in all jobs. They are fundamental processes and generally transferable to other work functions. Some of these are covered by the **key competencies**, although others may be added. The questions below highlight how these processes are applied in this unit of competency. Following each question a number indicates the level to which the key competency needs to be demonstrated where 0 = not required, 1 = perform the process, 2 = perform and administer the process, and 3 = perform, administer and design the process.

Key Competency	Example of Application	Performance Level
How can communication of ideas and information be applied?	Identifying suspect behaviour and relaying to relevant personnel may require information and ideas to be communicated.	1
How can information be collected, analysed and organised ?	Information of security systems needs to be collected, analysed and organised.	1
How are activities planned and organised ?	Checking customer bags may require activities to be planned and organised.	1
How can team work be applied?	Team work may be required when identifying suspect customer behaviour.	1
How can the use of mathematical ideas and techniques be applied?	Mathematical ideas and techniques may not be required in this unit.	0
How can problem solving skills be applied?	Problem solving may be required when dealing with theft.	1
How can the use of technology be applied?	Use of technology may be required when reporting and recording theft.	1

EVIDENCE GUIDE (CONTINUED)

Context of Assessment

Assessment Process

For valid and reliable assessment of this unit, evidence should be gathered through a range of methods to indicate consistent performance.

It can be gathered from assessment of the unit of competency alone, through an integrated assessment activity or through a combination of both.

Evidence should be gathered as part of the learning process.

Integrated Competency Assessment

Evidence is most relevant when provided through an integrated activity which combines the elements of competency for each unit, or a cluster of units of competency.

The candidate will be required to:

- Apply knowledge and skills which underpin the process required to demonstrate competence, including appropriate key competencies.
- Integrate knowledge and skills critical to demonstrating competence in this unit.

Unit WRRLP2B can be assessed with the following units:

WRRCS2B Apply point of sale handling procedures

WRRCS3B Interact with customers

WRR11B Perform stock control procedures

WRRF1B Balance the register/terminal

Evidence Gathering Methods

Evidence should include products, processes and procedures from the workplace context or a simulated work environment. Evidence might include:

- Observation of the person in the workplace
- A simulated work environment
- Third party reports from a supervisor
- Customer feedback
- Answers to questions about specific skills and knowledge

Resources Required

- A real or simulated work environment
- Relevant documentation, such as:
 - store policy and procedures manuals
 - legislation and statutory regulations
 - industry codes of practice
 - Trade Practices and Fair Trading Acts
- Relevant security equipment
- Point of sale equipment

WRRLP3B

MAINTAIN STORE SAFETY

This unit is based on the National Occupational Health and Safety Commission (NOHSC) Guidelines and encompasses the competencies required to maintain store safety in a retail environment. It involves informing and involving team members, monitoring and maintaining a safe working environment, implementing emergency procedures, identifying the need for occupational health and safety training and maintaining occupational health and safety records.

ELEMENTS OF COMPETENCY

PERFORMANCE CRITERIA

1 Inform team members

- 1.1 Store policies and procedures in regard to occupational health and safety and emergency procedures clearly and accurately explained to team members.
- 1.2 Team members given access to store policy.
- 1.3 Relevant provisions of occupational health and safety legislation and codes clearly and accurately explained to team members.
- 1.4 Information on identified hazards and risk control procedures regularly provided and clearly and accurately explained to team members.

2 Involve team members

- 2.1 Provide opportunities and processes for team members to consult and contribute on occupational health and safety issues according to store policy.
- 2.2 Issues raised are resolved promptly or referred to relevant personnel according to store policy.
- 2.3 Outcomes of issues raised on occupational health and safety matters promptly conveyed to team members.

3 Monitor and maintain a safe working environment

- 3.1 Store policies and procedures implemented with regard to identification, prevention and reporting of potential hazards.
- 3.2 Prompt action taken to deal with hazardous events according to store policies.
- 3.3 Unsafe or hazardous events investigated to identify cause and inadequacies in risk control measures or resource allocation for risk control measures identified and reported to relevant personnel.
- 3.4 Control measures to prevent re-occurrence and minimise risks of unsafe and hazardous events implemented and monitored according to store

policy and the hierarchy of control.

ELEMENTS OF COMPETENCY

PERFORMANCE CRITERIA

3 Monitor and maintain a safe working environment (cont.)

- 3.5 Hazardous goods handled and stored in accordance with store policy and occupational health and safety regulations.
- 3.6 Equipment maintained in accordance with store policy and occupational health and safety regulations.
- 3.7 Team performance monitored to ensure use of safe manual handling techniques.

4 Implement emergency procedures

- 4.1 Store emergency policies and procedures implemented promptly in the event of an emergency.

5 Identify need for occupational health and safety training

- 5.1 Occupational health and safety training needs identified accurately, specifying gaps between occupational health and safety competencies required and those held by team members.
- 5.2 Training organised/arranged according to store policy.

6 Maintain occupational health and safety records

- 6.1 Occupational health and safety records and legal requirements for the maintenance of records for occupational injury and disease completed accurately and legibly, according to store policy.
- 6.2 Information from records used to identify hazards and monitor risk control procedures according to store policy.

RANGE OF VARIABLES

The Range of Variables provide the range of applications of this unit of competency to allow for differences within enterprises and workplaces. It provides details of practices, knowledge and requirements referred to in the elements and performance criteria. The variables chosen in training and assessment will depend on the work contexts.

The following variables may include but are not limited to:

- Store policies and procedures in regard to:
 - occupational health and safety
 - emergency procedures
- Occupational health and safety procedures may deal with:
 - customers
 - staff
 - equipment
 - premises
 - stock
 - manual handling
- Emergencies may include:
 - sickness
 - accidents
 - fire
 - store evacuation involving staff or customers
 - product recall/contamination
 - bomb threat
 - cyclones
 - dealing with dangerous customers
- Hazardous goods/equipment may include:
 - use and storage of hazardous/chemical sprays
 - handling products treated with chemicals
 - poisonous/allergenic effects of products
 - electricity and water
- Correct use of equipment and protective gear may include:
 - correct foot wear
 - protective gear (eyes, face, hands)
- Occupational health and safety information may include:
 - general duty of care
 - requirements for the maintenance and confidentiality of records of occupational injury and disease
 - provision of information and training
 - regulations and codes of practice relating to hazards present in work area
 - health and safety representatives and occupational health and safety committees
 - issue resolution

RANGE OF VARIABLES (CONTINUED)

- Hazardous events may include:
 - accidents
 - fires
 - chemical spills
 - bomb threats
- Procedures for dealing with hazardous events may include:
 - evacuation
 - chemical containment
 - first aid procedures
- Store emergency policies and procedures may include:
 - alarm systems and procedures
 - fire fighting procedures
 - store evacuation procedures for staff and customers
 - transport arrangements for sick and/or injured persons
 - medical attention procedures
 - events likely to endanger staff or customers
 - product recall/contamination

EVIDENCE GUIDE

The following components of the evidence guide relate directly to the performance criteria and the range of variables for the unit of competency and provide guidance for assessment of the unit in the workplace and/or training program.

Critical Aspects of Evidence

Competency in this unit requires evidence that the candidate:

- Applies and monitors store policies and procedures, industry codes of practice, relevant legislation and statutory requirements in regard to occupational health and safety and emergency procedures.
- Applies and monitors safe work practices in the handling and moving of stock, according to occupational health and safety legislation/regulations/codes of practice.
- Interprets and monitors the implementation of manufacturers' instructions with regard to handling stock and using relevant equipment.
- Applies and monitors safe work practices in the handling, storage and disposal of unsafe or hazardous materials.
- Identifies occupational health and safety training needs and maintains occupational health and safety records.

Underpinning Skills and Knowledge

Knowledge and skills are essential to apply this unit in the workplace, to transfer to other contexts and deal with unplanned events. The requirements for this unit of competency are listed below:

Knowledge of:

- Store policies and procedures, in regard to:
 - occupational health and safety
 - emergency procedures
 - unsafe or hazardous goods
 - handling and storage
 - disposal
 - bomb threat procedures
 - store evacuation
- Manual handling and safe lifting techniques
- Possible fire and safety hazards
- Sickness and accident procedures
- Location of nearest first aid assistant/facility
- Hierarchy of risk control:
 - elimination of hazards
 - engineering controls to reduce risk
 - administrative controls
 - use of personal protective equipment
- Relevant occupational health and safety legislation/regulations/codes of practice
- Principles and techniques in interpersonal communication

EVIDENCE GUIDE (CONTINUED)

Skills in:

- Interpersonal communication skills including:
 - giving feedback
 - coaching
 - performance analysis
 - questioning/listening/observation
 - group presentation
 - team motivation
 - negotiation
 - verbal and non verbal communication
 - team leadership
- Literacy and numeracy skills in regard to:
 - interpreting and applying occupational health and safety documents
 - reporting procedures

Generic Process Skills

There are a number of processes that are learnt throughout work and life which are required in all jobs. They are fundamental processes and generally transferable to other work functions. Some of these are covered by the **key competencies**, although others may be added. The questions below highlight how these processes are applied in this unit of competency. Following each question a number indicates the level to which the key competency needs to be demonstrated where 0 = not required, 1 = perform the process, 2 = perform and administer the process, and 3 = perform, administer and design the process.

Key Competency	Example of Application	Performance Level
How can communication of ideas and information be applied?	By informing team members of store policies and procedures.	2
How can information be collected, analysed and organised ?	By identifying relevant occupational health and safety policies and procedures.	2
How are activities planned and organised ?	Developing emergency policies and procedures requires activities to be planned and organised.	2
How can team work be applied?	Encouraging team members to contribute to occupational health and safety issues requires team work to be applied.	2
How can the use of mathematical ideas and techniques be applied?	The use of mathematical ideas and techniques may not be applicable to this unit.	0

Metal and Engineering Training Package

WRRLP3B Maintain Store Safety

How can problem solving skills be applied?	Identifying hazardous events and implementing control procedures requires problem solving skills to be applied.	2
How can the use of technology be applied?	Maintaining records may require the use of technology.	2

EVIDENCE GUIDE (CONTINUED)

Context of Assessment

Assessment Process

For valid and reliable assessment of this unit, evidence should be gathered through a range of methods to indicate consistent performance.

It can be gathered from assessment of the unit of competency alone, through an integrated assessment activity or through a combination of both.

Evidence should be gathered as part of the learning process.

Integrated competency assessment

Evidence is most relevant when provided through an integrated activity which combines the elements of competency for each unit, or a cluster of units of competency.

The candidate will be required to:

- Apply knowledge and skills which underpin the process required to demonstrate competence, including appropriate key competencies.
- Integrate knowledge and skills critical to demonstrating competence in this unit.

Unit WRRLP3B can be assessed with the following unit:

WRRLP4B Maintain store security

Evidence Gathering Methods

Evidence should include products, processes and procedures from the workplace context or from a simulated work environment. Evidence might include:

- Observation of the person in the workplace
- A simulated role play
- Third party reports from a supervisor
- Customer feedback
- Answers to questions about specific skills and knowledge

Resources Required

- A real or simulated work environment
- Access to relevant equipment such as:
 - stock moving equipment
 - alarm systems
 - first aid equipment
 - fire fighting equipment
 - communication equipment
- Relevant documentation, such as:
 - occupational health and safety legislation
 - store evacuation procedures
 - store policy and procedures manuals

WRRLP6C

APPLY RETAIL FOOD SAFETY PRACTICES

This unit involves the skills and knowledge required for personal hygiene, food handling, cleaning practices and procedures and implementing a Food Safety Plan, according to health and hygiene requirements and store procedures. It is based on and is equivalent to the units FDFCORFS1A Apply Basic Food Safety Practices and FDFCORFS2A Implement the Food Safety Plan from the National Food Processing Industry Training Package, but has been customised with additional outcomes.

ELEMENTS OF COMPETENCY

PERFORMANCE CRITERIA

- | | |
|--|--|
| 1 Apply personal hygiene and sanitation | 1.1 Personal hygiene practices identified and practised.
1.2 Protective clothing and equipment identified, maintained and used.
1.3 Personal movement within and outside workplace conforms to work area requirements.
1.4 Personal presentation maintained according to store procedures. |
| 2 Identify food safety plan/program | 2.1 Store food safety plan/program accurately identified and interpreted.
2.2 Food safety plan/program implemented. |
| 3 Handle product hygienically | 3.1 Correct product handling practices identified and practised.
3.2 Procedures to ensure that products are protected from contamination identified and practised.
3.3 Implements for handling products identified and used.
3.4 Food handling implements changed between handling different products. |
| 4 Clean work area and equipment | 4.1 Cleaning requirements for work areas identified and practised according to work area standards.
4.2 External and internal cleaning requirements for equipment identified and practised.
4.3 Cleaning tools, consumables and equipment for a variety of applications identified and used.
4.4 Routine maintenance requirements for work areas and equipment identified and practised.
4.5 Maintenance requirements/problems reported to |

appropriate personnel without delay.

- 4.6 Handling and storage requirements for cleaning chemicals identified and observed.
- 4.7 Waste disposal and pest control procedures identified and performed according to legislative requirements.

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ELEMENTS OF COMPETENCY	PERFORMANCE CRITERIA
5 Monitor food safety	<p>5.1 Critical control points monitored to control food safety risk.</p> <p>5.2 Out of control processes or situations identified and corrective action taken.</p> <p>5.3 Food safety information, including equipment breakdowns, accurately recorded according to critical control points and work area standards.</p>
6 Contribute to continuous improvement	<p>6.1 Hygiene and sanitation problems/situations, including potential sources of food contamination, identified promptly and rectified or reported to relevant personnel.</p> <p>6.2 Conditions which promote microbial growth, identified promptly and rectified or reported to relevant personnel.</p>

RANGE OF VARIABLES

The Range of Variables provide the range of applications of this unit of competency to allow for differences within enterprises and workplaces. It provides details of practices, knowledge and requirements referred to in the elements and performance criteria. The variables chosen in training and assessment will depend on the work contexts.

The following variables may include but are not limited to:

- Store policies and procedures in regard to:
 - hygiene and sanitation practices
- Legislation and statutory requirements may include:
 - occupational health and safety
 - environmental protection legislation
 - waste disposal
 - hazardous substances and dangerous goods
 - manual handling
 - food safety regulations
- Personal hygiene practices may include:
 - hand washing procedures
 - personal presentation and cleanliness
 - hair tied back, under net or under cap
 - not touching hair
 - not sneezing near food
 - wearing of jewellery
 - reporting of personal illnesses/infections
 - wounds, cuts, wearing of bandages or dressings
 - changing gloves when handling different products
- Personal movement may include:
 - removing protective clothing prior to moving outside or from one area to another
 - not moving into defined areas
- Safety requirements may include:
 - wearing gloves to protect hands from cleaning chemicals, heat or cold (insulation)
 - wearing mesh gloves when using or cleaning sharp equipment
 - wearing protective clothing, footwear
 - use of equipment, such as ovens, slicers, knives, tongs
- Protective clothing may include:
 - preventing contamination/cross contamination of food
 - wearing of gloves, hairnets, hats, shoes, uniforms, outer garments and aprons when handling food as required
 - clothing maintenance, laundering and storage requirements

RANGE OF VARIABLES (CONTINUED)

- Product handling procedures may include:
 - variety of products eg, meat, chicken, fish, seafood, milk products
 - cooked/uncooked, hot/cold products
 - avoidance of contamination/cross contamination
 - proximity of chemicals to food products
 - use and storage of chemicals
- Food handling implements may include:
 - gloves
 - tongs
 - spoons
 - scoops
- Work areas and equipment may include:
 - walls to required levels
 - benches
 - storage/display units
 - cool rooms, refrigerators
 - ovens, bain maries, rotisseries, grills, deep fryers, hot plates
 - knives, slicers
 - drink machines, milk shake makers, coffee makers
- Cleaning requirements may include:
 - time of day
 - work area
- Relevant personnel may include:
 - store supervisor
 - manager
 - team leader
- Improvement in continuous improvement may include:
 - participation in structured improvement program
 - day to day problem solving

EVIDENCE GUIDE

The following components of the evidence guide relate directly to the performance criteria and the range of variables for the unit of competency and provide guidance for assessment of the unit in the workplace and/or training program.

Critical Aspects of Evidence

Competency in this unit requires evidence that the candidate:

- Consistently applies store policies and procedures which comply with consumer law and legislative requirements in regard to hygiene and sanitation practices.
- Consistently follows and applies relevant legislation and statutory requirements including consumer law, occupational health and safety, hygiene and sanitation, environmental issues and store policies and procedures especially in regard to safe handling and storage of product.
- Consistently applies industry codes of practice.
- Consistently and accurately identifies, interprets, applies and implements the store food safety plan/program, according to health and hygiene requirements and store procedures.
- Consistently follows and applies store policies and procedures with regard to use of cleaning equipment and safe handling and disposal of waste.
- Consistently follows store policies and procedures with regard to personal hygiene practices including:
 - personal cleanliness, reporting of personal illness/infections
 - store personal presentation requirements for hair, clothes, footwear, jewellery
 - hand washing procedures
 - use and maintain clothing/footwear and related apparatus to meet hygiene requirements.
- Consistently inspects own work area and identifies common food safety hazards and possible causes.
- Consistently follows and applies store policies and procedures with regard to removal and isolation of suspect product and/or taking other corrective action.
- Consistently maintains personal conduct to minimise risk to food safety.
- Consistently monitors critical control points to identify food safety risks in own work area. This may include carrying out checks, inspections and tests.
- Consistently investigates contamination/cross-contamination events and takes action to prevent contamination from occurring/recurring.
- Consistently records food safety information according to store policies and procedures.
- Consistently contributes to continuous improvement in own work area.

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EVIDENCE GUIDE (CONTINUED)

Underpinning Skills and Knowledge

Knowledge and skills are essential to apply this unit in the workplace, to transfer to other contexts and deal with unplanned events. The requirements for this unit of competency are listed below:

Knowledge of:

- Store policies and procedures, in regard to:
 - personal hygiene practices
- Correct protective clothing
- Safety requirements to protect self and others
- Food handling and hygiene principles including:
 - awareness of the store food safety plan/program, its purpose and implications for own work
 - own roles and responsibilities and those of food safety personnel for food handling requirements from raw material to finished product
 - methods/techniques for minimising contamination and spoilage
 - common sources and types of contamination/food safety hazards, including conditions conducive to microbial growth and known allergens associated with food handling and processing
 - common types of physical, chemical and micro-biological agents which can contaminate food
 - conditions which can cause physical, chemical and micro-biological contamination
 - correct storage of food including hot/cold, raw/cooked and relevant critical control points
 - causes of deterioration of food, contamination, cross contamination
 - store procedures for identifying and reporting potential or actual sources of contamination
 - food handling implements eg. gloves, tongs
 - need for change of implements between products
 - need for frequent change of storage medium for serving implements
 - shelf life of products
 - Hazards Analysis and Critical Control Points (HACCP)
- Load limits of storage, display units to maintain correct temperatures including:
 - effects of breaking temperature curtain, effects of blocking coils/air vents
 - overloading
- Procedures for recording failures in the food safety plan/program, including equipment breakdowns, and immediate action to be taken
- Cleaning of work area:
 - store cleaning procedures/schedules for work areas and equipment (internal/external)
 - purpose and importance of cleaning and sanitation procedures
 - safe use and storage of cleaning tools, equipment and cleaning chemicals/insecticides/pesticides
 - routine maintenance for work areas and equipment
 - waste collection and disposal, recycling and handling procedures
 - pest control procedures used in the workplace
- Relevant legislation and statutory requirements

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EVIDENCE GUIDE (CONTINUED)

- Relevant occupational health and safety requirements
- Food safety policies, plans and responsibilities including an understanding of the relationship between the quality system, the food safety plan/program and audit requirements
- Characteristics of materials, product and processes used to carry out work responsibilities
- Relevant industry codes of practice

Skills in:

- Handling of chemicals
- Maintaining work area
- Product handling
- Use of personal protective equipment
- Literacy and numeracy skills in regard to:
 - reading and understanding store procedures

Generic Process Skills

There are a number of processes that are learnt throughout work and life which are required in all jobs. They are fundamental processes and generally transferable to other work functions. Some of these are covered by the **key competencies**, although others may be added. The questions below highlight how these processes are applied in this unit of competency. Following each question a number indicates the level to which the key competency needs to be demonstrated where 0 = not required, 1 = perform the process, 2 = perform and administer the process, and 3 = perform, administer and design the process.

Key Competency	Example of Application	Performance Level
How can communication of ideas and information be applied?	Hygiene and sanitation problems/situations need to be communicated to relevant personnel.	1
How can information be collected, analysed and organised ?	Store food safety plan/program needs to be identified, analysed and organised.	2
How are activities planned and organised ?	Maintaining and cleaning work area and equipment requires activities to be planned and organised.	2
How can team work be applied?	Team work will be required to maintain work areas.	1
How can the use of mathematical ideas and techniques be applied?	Handling cleaning chemicals will require the use of mathematical ideas and techniques.	2

Metal and Engineering Training Package

WRRLP6C Apply Retail Food Safety Practices

How can problem solving skills be applied?	Problem solving skills will be required when rectifying hygiene and sanitation problems/situations.	2
How can the use of technology be applied?	Various equipment throughout this unit will require the use of technology.	2

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EVIDENCE GUIDE (CONTINUED)

Context of Assessment

Assessment Process

For valid and reliable assessment of this unit, evidence should be gathered through a range of methods to indicate consistent performance.

It can be gathered from assessment of the unit of competency alone, through an integrated assessment activity or through a combination of both.

Evidence should be gathered as part of the learning process.

Integrated Competency Assessment

Evidence is most relevant when provided through an integrated activity which combines the elements of competency for each unit, or a cluster of units of competency.

The candidate will be required to:

- Apply knowledge and skills which underpin the process required to demonstrate competence, including appropriate key competencies.
- Integrate knowledge and skills critical to demonstrating competence in this unit.

Unit WRRLP6C can be assessed with the other units that make up a particular job function.

Evidence Gathering Methods

Evidence should include products, processes and procedures from the workplace context or from a simulated work environment. Evidence might include:

- Observation of the person in the workplace
- Simulated role play
- Third party reports from a supervisor
- Customer feedback
- Answers to questions about specific skills and knowledge

Resources Required

- A real or simulated work environment
- A food safety plan/program, based on Hazards Analysis and Critical Control Points (HACCP)
- Protective clothing
- Cleaning materials and chemicals
- Pest control equipment/chemicals
- Suitable merchandise
- Relevant documentation such as store policy and procedures on hygiene and sanitation practices
- Food handling implements
- Food storage and display equipment

WRRM1B

MERCHANDISE PRODUCTS

This unit encompasses the skills, knowledge and attitudes required to merchandise products within a retail store. It involves the arrangement and presentation of merchandise, setting up and maintaining displays and labelling or pricing stock.

ELEMENTS OF COMPETENCY

PERFORMANCE CRITERIA

1 Place and arrange merchandise

- 1.1 Merchandise unpacked in accordance with store procedures.
- 1.2 Merchandise placed on floor, fixtures and shelves in determined locations.
- 1.3 Merchandise displayed to achieve a balanced fully stocked appearance and promote sales.
- 1.4 Damaged, soiled or out of date stock identified and corrective action taken as required according to store procedure.
- 1.5 Stock range placed to conform with fixtures, ticketing, prices or bar codes.
- 1.6 Stock rotated according to stock requirements and store procedure.
- 1.7 Stock presentation conforms to special handling techniques and other safety requirements.

2 Prepare display labels/tickets

- 2.1
Labels/
tickets for window, wall or floor displays prepared according to store policy.
- 2.2 Tickets prepared using electronic equipment or neatly by hand according to store procedures.
- 2.3 Soiled, damaged, illegible or incorrect labels/tickets identified and corrective action taken.
- 2.4 Electronic ticketing equipment used and maintained according to design specifications.
- 2.5 Ticketing equipment maintained and stored in a secure location.

3 Place, arrange and display price tickets and labels

- 3.1 Tickets/labels are visible and correctly placed on merchandise.
- 3.2 Labels/tickets replaced according to store policy.
- 3.3 Correct pricing and information maintained on

merchandise according to store procedures,
industry codes of practice and legislative
requirements.

ELEMENTS OF COMPETENCY	PERFORMANCE CRITERIA
4 Maintain displays	4.1 Special promotion areas reset and dismantled. 4.2 Supervisor assisted in selection of merchandise for display. 4.3 Merchandise arranged/faced up as directed and/or according to layout specifications and load bearing capacity of fixtures. 4.4 Unsuitable or out of date displays identified, reset and/or removed as directed. 4.5 Optimum stock levels identified and stock replenished according to store policy. 4.6 Display areas maintained in a clean and tidy manner. 4.7 Excess packaging removed from display areas.
5 Protect merchandise	5.1 Correct handling, storage and display techniques identified and used according to stock characteristics and legislative requirements.

RANGE OF VARIABLES

The Range of Variables provide the range of applications of this unit of competency to allow for differences within enterprises and workplaces. It provides details of practices, knowledge and requirements referred to in the elements and performance criteria. The variables chosen in training and assessment will depend on the work contexts.

The following variables may include but are not limited to:

- Store policy and procedures in regard to:
 - merchandising of stock
 - preparing and displaying tickets/labels
 - maintaining displays
- Displays may include:
 - setting new displays
 - maintaining existing ones
- Tickets and pricing requirements may include:
 - pricing gun
 - shelf tickets
 - shelf talkers
 - written labels
 - swing ticketing
 - bar coding
 - price boards
 - header boards
- Handling techniques may vary according to:
 - stock characteristics
 - industry codes of practice
- Merchandise may be characterised by:
 - type
 - brand
 - size
 - customer needs
 - colour
 - price
- Legislative requirements may include:
 - pricing requirements including Goods and Services Tax (GST) requirements
 - industry codes of practice
 - discounted items
 - Trade Practices and Fair Trading Acts
- Safety requirements may include:
 - transport, storage and handling of goods
 - hazardous substances
 - labelling of workplace substances

EVIDENCE GUIDE

The following components of the evidence guide relate directly to the performance criteria and the range of variables for the unit of competency and provide guidance for assessment of the unit in the workplace and/or training program.

Critical Aspects of Evidence

Competency in this unit requires evidence that the candidate:

- Consistently applies store policies and procedures in regard to displaying, merchandising, ticketing, pricing and storage of stock.
- Displays merchandise on floor, fixtures, shelves/display areas, in determined locations, in accordance with special manual handling techniques and other safety requirements.
- Prepares display labels and price tickets for merchandise with regard to store policies and procedures.
- Operates, maintains and stores a range of ticketing equipment according to:
 - store policy and procedures
 - industry codes of practice
 - manufacturers' instructions and design specifications.
- Arranges correct pricing and information on merchandise according to store procedures, industry codes and government requirements.
- Identifies damaged, soiled or out of date stock and takes corrective action as required by store procedures and legislative requirements.
- Maintains display areas and replenishes stock as required in accordance with store procedures and legislative requirements.
- Performs correct manual handling, storage and display techniques according to:
 - stock characteristics
 - industry codes of practice
 - occupational health and safety legislation/regulations/codes of practice.

Underpinning Skills and Knowledge

Knowledge and skills are essential to apply this unit in the workplace, to transfer to other contexts and deal with unplanned events. The requirements for this unit of competency are listed on the following page:

Knowledge of:

- Store policies and procedures, in regard to:
 - merchandising, ticketing and pricing of stock
 - correct storage of stock
 - store promotional themes, including advertising, catalogues and special offers
 - location of display areas
 - availability and use of display materials
 - stock rotation
 - stock replenishment
 - merchandise range
 - scheduling for building or rotating displays
 - correct storage procedures for labelling/ticketing equipment and materials
- Correct manual handling techniques for protection of self and merchandise

EVIDENCE GUIDE (CONTINUED)

- Principles of display
- Elements and principles of design and trends in retail design
- Relevant occupational health and safety regulations including:
 - manual handling
 - hygiene and sanitation
 - hazardous substances
 - labelling of workplace substances
- Relevant legislation and statutory requirements
- Pricing procedures including inclusion/exclusion of Goods and Services Tax (GST)
- Relevant industry codes of practice

Skills in:

- Use and maintenance of manual and electronic labelling/ticketing equipment
- Completing tasks in a set time frame
- Literacy and numeracy skills in relation to:
 - reading and interpreting store procedures and guidelines
 - machine or manual preparation of labels/tickets
 - reading and understanding manufacturer's instructions

Generic Process Skills

There are a number of processes that are learnt throughout work and life which are required in all jobs. They are fundamental processes and generally transferable to other work functions. Some of these are covered by the **key competencies**, although others may be added. The questions below highlight how these processes are applied in this unit of competency. Following each question a number indicates the level to which the key competency needs to be demonstrated where 0 = not required, 1 = perform the process, 2 = perform and administer the process, and 3 = perform, administer and design the process.

Key Competency	Example of Application	Performance Level
How can communication of ideas and information be applied?	Information on arranging merchandise may need to be communicated to others.	1
How can information be collected, analysed and organised ?	Store procedures for arranging merchandise and preparing display tickets/labels will need to be collected, analysed and organised.	1
How are activities planned and organised ?	Placing and arranging merchandise will require planning and organising.	1
How can team work be applied?	Team work may be required to complete and maintain display areas.	1
How can the use of mathematical ideas and techniques be applied?	Maintaining stock levels and replenishing stock may require the use of mathematical ideas and techniques.	1

Metal and Engineering Training Package

WRRM1B Merchandise Products

How can problem solving skills be applied?	Problem solving skills may be applied when identifying merchandise for display.	1
How can the use of technology be applied?	The use of technology may be required for preparing display tickets/labels.	1

EVIDENCE GUIDE (CONTINUED)

Context of Assessment

Assessment Process

For valid and reliable assessment of this unit, evidence should be gathered through a range of methods to indicate consistent performance.

It can be gathered from assessment of the unit of competency alone, through an integrated assessment activity or through a combination of both.

Evidence should be gathered as part of the learning process.

Integrated Competency Assessment

Evidence is most relevant when provided through an integrated activity which combines the elements of competency for each unit, or a cluster of units of competency.

The candidate will be required to

- Apply knowledge and skills which underpin the process required to demonstrate competence, including appropriate key competencies.
- Integrate knowledge and skills critical to demonstrating competence in this unit.

Unit WRRM1B can be assessed with the following units:

WRRS2B Advise on products and services

WRRS1B Sell products and services

Evidence Gathering Methods

Evidence should include products, processes and procedures from the workplace context. Evidence might include:

- Observation of the person in the workplace
- Third party reports from a supervisor
- Customer feedback
- Answers to questions about specific skills and knowledge

Resources Required

- A retail work environment
- A range of ticketing and pricing equipment
- Merchandise for display
- Display materials and props
- Cleaning materials
- Relevant documentation, such as:
 - store policy and procedure manuals on housekeeping, merchandising and occupational health and safety
 - manufacturer's instructions/operation manuals on electronic ticketing equipment
 - relevant legislation and industry codes of practice

WRRM2B

PERFORM ROUTINE HOUSEKEEPING DUTIES

This unit encompasses the skills, knowledge and attitudes required to maintain and organise work areas in a retail environment. It involves applying personal hygiene practices by staff members and the organisation of the work area to keep the workplace tidy, clean and safe.

ELEMENTS OF COMPETENCY

PERFORMANCE CRITERIA

1 Organise work area

- 1.1 Work areas maintained in a safe, uncluttered and organised manner according to store policy.
- 1.2 All routines carried out safely, effectively and efficiently with minimum inconvenience to customers and staff, according to store policy.
- 1.3 Store policies and procedures for tidying work areas and placing items in designated areas applied.

2 Clean work area

- 2.1 Store policies and procedures for personal hygiene applied.
- 2.2 Store policies and procedures applied for cleaning of work area.
- 2.3 Waste promptly removed and disposed of according to store policy and legislative requirements.
- 2.4 Spills, food, waste, or other potential hazards reported to appropriate personnel and removed from floors according to store policy and legislative requirements.
- 2.5 Signage promptly displayed in regard to unsafe areas.
- 2.6 Equipment and consumable materials maintained and stored correctly after use.
- 2.7 Tools and equipment (including guards) cleaned and used in accordance with manufacturer's instructions and legislative requirements.

RANGE OF VARIABLES

The Range of Variables provide the range of applications of this unit of competency to allow for differences within enterprises and workplaces. It provides details of practices, knowledge and requirements referred to in the elements and performance criteria. The variables chosen in training and assessment will depend on the work contexts.

The following variables may include but are not limited to:

- Store policy and procedures in regard to:
 - housekeeping practices
 - personal hygiene
 - maintenance and storage of cleaning equipment
 - use and storage of cleaning chemicals
- Work areas may include:
 - counters
 - benches
 - sinks
 - point of sale terminals
 - point of sale areas
 - preparation areas
 - walkways and aisles
 - displays
 - fixtures and other working surfaces
- Handling and cleaning techniques may vary according to:
 - stock characteristics
 - industry codes of practice
- Unsafe areas may include:
 - spills
 - sharp edges
 - loose wiring
- Reporting of faults/problems may be conducted by:
 - face to face
 - email
 - phone
 - fax

Metal and Engineering Training Package

WRRM2B Perform Routine Housekeeping Duties

- Legislative requirements may include:
 - waste removal
 - environmental protection
 - transport, storage and handling of goods
 - hazardous substances and dangerous goods
 - labelling of workplace substances
 - occupational health and safety
 - use of protective clothing/equipment
- Appropriate personnel may include:
 - manager
 - area supervisor
 - team leader
 - colleagues

EVIDENCE GUIDE

The following components of the evidence guide relate directly to the performance criteria and the range of variables for the unit of competency and provide guidance for assessment of the unit in the workplace and/or training program.

Critical Aspects of Evidence

Competency in this unit requires evidence that the candidate:

- Consistently applies housekeeping duties to work area, point of sales terminals, walkways and fixtures/display areas.
- Consistently applies safe work practices in the operation and maintenance of a range of cleaning/housekeeping equipment according to:
 - store policy and procedures
 - occupational health and safety legislation/regulations/codes of practice
 - industry codes of practice
 - manufacturers' instructions and design specifications.
- Applies store housekeeping program of work area and reports faults/problems to relevant person/department.
- Reads, accurately interprets and consistently applies manufacturers' instructions for cleaning products, tools and equipment.
- Completes tasks in set time frame.

Underpinning Skills and Knowledge

Knowledge and skills are essential to apply this unit in the workplace, to transfer to other contexts and deal with unplanned events. The requirements for this unit of competency are listed on the following page:

Knowledge of:

- Store policies and procedures, in regard to:
 - housekeeping
 - use and maintenance of store cleaning equipment
 - personal hygiene
 - waste disposal and environmental protection
 - reporting problems and faults
- Relevant occupational health and safety regulations
- Relevant labels to identify chemicals and hazardous substances/HAZCHEM labels
- Manufacturer's instructions for use of cleaning materials or hazardous substances
- Manufacturer's instructions for use of cleaning equipment
- Relevant legislation and statutory requirements
- Relevant industry codes of practice

Skills in:

- Using and maintaining cleaning equipment
- Using and storing chemicals, hazardous substances and flammable materials
- Using electrical and other equipment safely

EVIDENCE GUIDE (CONTINUED)

- Literacy and numeracy skills in:
 - reading and understanding manufacturer’s instructions
 - reading and understanding warning labels and instructions for the use of chemicals and hazardous substances

Generic Process Skills

There are a number of processes that are learnt throughout work and life which are required in all jobs. They are fundamental processes and generally transferable to other work functions. Some of these are covered by the **key competencies**, although others may be added. The questions below highlight how these processes are applied in this unit of competency. Following each question a number indicates the level to which the key competency needs to be demonstrated where 0 = not required, 1 = perform the process, 2 = perform and administer the process, and 3 = perform, administer and design the process.

Key Competency	Example of Application	Performance Level
How can communication of ideas and information be applied?	Faults or problems will need to be communicated to relevant personnel.	1
How can information be collected, analysed and organised ?	Store policies and procedures for cleaning work areas will need to be collected, analysed and organised.	1
How are activities planned and organised ?	Cleaning work areas and disposing of waste will require activities to be planned and organised.	1
How can team work be applied?	Team work may be required when carrying out routine procedures and reporting to relevant personnel.	1
How can the use of mathematical ideas and techniques be applied?	Mathematical ideas and techniques may be required when measuring out chemicals.	1
How can problem solving skills be applied?	Problem solving skills may be required to clean particular areas.	1
How can the use of technology be applied?	Technology may be required when operating a range of cleaning equipment.	1

**Context of Assessment
Assessment Process**

For valid and reliable assessment of this unit, evidence should be gathered through a range of methods to indicate consistent performance.

It can be gathered from assessment of the unit of competency alone, through an integrated assessment activity or through a combination of both.

Evidence should be gathered as part of the learning process.

Metal and Engineering Training Package

WRRM2B Perform Routine Housekeeping Duties

EVIDENCE GUIDE (CONTINUED)

Integrated Competency Assessment

Evidence is most relevant when provided through an integrated activity which combines the elements of competency for each unit, or a cluster of units of competency.

The candidate will be required to

- Apply knowledge and skills which underpin the process required to demonstrate competence, including appropriate key competencies.
- Integrate knowledge and skills critical to demonstrating competence in this unit.

Unit WRRM2B can be assessed with the following units:

WRRCS1B Communicate in the workplace
WRRER1B Work effectively in a retail environment
WRRLP1B Apply safe working practices
WRRCA1B Operate retail equipment

Evidence Gathering Methods

Evidence should include products, processes and procedures from the workplace context or from a simulated work environment. Evidence might include:

- Observation of the person in the workplace
- A simulated role play
- Third party reports from a supervisor
- Customer feedback
- Answers to questions about specific skills and knowledge

Resources Required

- A real or simulated work environment
- Cleaning/store housekeeping equipment and materials
- Relevant documentation, such as:
 - store policy and procedures manuals on housekeeping, cleaning and occupational health and safety
 - manufacturer's instructions/operation manuals on cleaning equipment and materials
 - manual handling regulations and industry codes of practice
 - plant and equipment regulations

WRRO1B

Manage Merchandise and Store Presentation

This unit encompasses a range of competencies required to manage merchandise and store presentation. It involves managing store merchandising, planning and managing store advertising and promotions, managing store pricing policies and managing housekeeping.

ELEMENTS OF COMPETENCY

PERFORMANCE CRITERIA

- | | | |
|----------|---|---|
| 1 | Manage store merchandising | <ul style="list-style-type: none">1.1 Layout and presentation support market position and promote customer flow according to store policy.1.2 Layout assessment checks developed and implemented.1.3 Standards for visual presentations and displays defined and clearly communicated to all staff.1.4 Staff consulted to assess customer response to space allocations. |
| 2 | Plan and manage store advertising and promotions | <ul style="list-style-type: none">2.1 Store policies and procedures, managed and implemented in regard to store promotional activities.2.2 Activities organised in line with anticipated/researched customer requirements.2.3 Promotions managed in order to achieve maximum customer impact.2.4 Arrangements with suppliers negotiated in regard to special promotional activities.2.5 Store activities coordinated to complement shopping centre/retail complex promotions.2.6 Assessment checks developed and implemented to measure effectiveness of promotions including layout, visual impact and customer response.2.7 Promotional activities accurately documented and reported on. |

ELEMENTS OF COMPETENCY	PERFORMANCE CRITERIA
3 Manage store pricing policies	<ul style="list-style-type: none">3.1 Store policies and procedures maintained in regard to pricing.3.2 Accurate information on pricing trends and changes maintained and communicated to relevant staff.3.3 Procedures developed and implemented for pricing according to store policies and legislative requirements.
4 Manage housekeeping	<ul style="list-style-type: none">4.1 Store policies and procedures developed and implemented in regard to store housekeeping and maintenance.4.2 Roster/schedules developed and managed, ensuring store housekeeping standards are monitored and maintained.4.3 Contingency plan initiated in the event of merchandise or store presentation problems.

RANGE OF VARIABLES

The Range of Variables provide the range of applications of this unit of competency to allow for differences within enterprises and workplaces. It provides details of practices, knowledge and requirements referred to in the elements and performance criteria. The variables chosen in training and assessment will depend on the work contexts.

The following variables may include but are not limited to:

- Store policies and procedures in regard to:
 - promotion of products and services
 - housekeeping
- Pricing procedures may include:
 - marking down of slow moving stock
 - soiled or damaged goods
 - goods close to use-by date
 - end of season stock
- Store merchandising plan may include:
 - target market/market research
 - store image
 - store layout and space availability
 - seasonal lines
 - pricing policy
- Customer market research may be:
 - formal
 - informal
- Promotions may include:
 - advertising
 - catalogues
 - newspapers
 - posters
 - radio or TV
 - suppliers
 - Internet/website
- Promotions may involve:
 - external and in-store activities
 - corporate or locally based
 - dealing with advertising agencies and consultants

RANGE OF VARIABLES (CONTINUED)

- Pricing policies may include:
 - long term and short term
 - internal and external considerations
 - pricing policies including Goods and Services Tax (GST) requirements
- Legislative requirements may include:
 - Trade Practices and Fair Trading Acts
 - consumer law
- Housekeeping may include:
 - store premises
 - fittings
 - fixtures
 - equipment
- Contingency plans may include:
 - major spillages
 - flood/storm
 - breakages
 - black out
 - break in

EVIDENCE GUIDE

The following components of the evidence guide relate directly to the performance criteria and the range of variables for the unit of competency and provide guidance for assessment of the unit in the workplace and/or training program.

Critical Aspects of Evidence

Competency in this unit requires evidence that the candidate:

- Collaboratively plans layout and presentation of merchandise according to store policies and procedures.
- Assesses effectiveness of layout and presentation according to sales targets and/or predetermined objectives.
- Collaboratively plans, coordinates and implements advertising and promotions activities according to store policies and procedures.
- Assesses and reports on effectiveness of advertising and promotions to staff and management according to store policies and procedures.
- Collaboratively plans, coordinates and implements pricing activities according to store policies and procedures.
- Collaboratively plans, coordinates and implements housekeeping activities according to store policies and procedures and occupational health and safety legislation/regulations/codes of practice.

Underpinning Skills and Knowledge

Knowledge and skills are essential to apply this unit in the workplace, to transfer to other contexts and deal with unplanned events. The requirements for this unit of competency are listed below:

Knowledge of:

- Store policies and procedures, in regard to:
 - layout and presentation
 - advertising and promotions
 - pricing/marketing down of goods, including risk assessment
 - housekeeping for premises, fittings, fixtures and equipment
 - store merchandise and service range
 - store merchandising plan
 - range and availability of new products and services
 - customer demand and market trends
 - product quality standards
- Occupational health and safety legislation/regulations/codes of practice
- Relevant legislation and statutory requirements
- Relevant industry codes of practice
- Pricing procedures including Goods and Services Tax (GST) requirements
- Principles and techniques in:
 - visual merchandising
 - project management

EVIDENCE GUIDE (CONTINUED)

Skills in:

- Providing feedback on performance
- Communicating store standards and expectations
- Report presentation
- Literacy skills in regard to:
 - researching, analysing and interpreting a broad range of written material
 - preparing reports
 - documenting results

Generic Process Skills

There are a number of processes that are learnt throughout work and life which are required in all jobs. They are fundamental processes and generally transferable to other work functions. Some of these are covered by the **key competencies**, although others may be added. The questions below highlight how these processes are applied in this unit of competency. Following each question a number indicates the level to which the key competency needs to be demonstrated where 0 = not required, 1 = perform the process, 2 = perform and administer the process, and 3 = perform, administer and design the process.

Key Competency	Example of Application	Performance Level
How can communication of ideas and information be applied?	Pricing trends and changes need to be communicated to relevant staff.	3
How can information be collected, analysed and organised ?	Developing and implementing assessment checks requires information to be collected, analysed and organised.	3
How are activities planned and organised ?	Coordinating store activities to complement shopping centre/retail complex promotions requires activities to be planned and organised.	3
How can team work be applied?	Team work will be applied when consulting with staff to assess customer response to space allocations.	3
How can the use of mathematical ideas and techniques be applied?	Mathematical ideas and techniques may be applied when developing pricing procedures.	2
How can problem solving skills be applied?	Problem solving skills will be applied when initiating a contingency plan in the event of merchandise or store presentation problems.	3
How can the use of technology be applied?	The use of technology may be applied when developing rosters/schedules and developing promotional activities.	2

EVIDENCE GUIDE (CONTINUED)

Context of Assessment

Assessment Process

For valid and reliable assessment of this unit, evidence should be gathered through a range of methods to indicate consistent performance.

It can be gathered from assessment of the unit of competency alone, through an integrated assessment activity or through a combination of both.

Evidence should be gathered as part of the learning process.

Integrated Competency Assessment

Evidence is most relevant when provided through an integrated activity which combines the elements of competency for each unit, or a cluster of units of competency.

The candidate will be required to:

- Apply knowledge and skills which underpin the process required to demonstrate competence, including appropriate key competencies.
- Integrate knowledge and skills critical to demonstrating competence in this unit.

Unit WRRO1B can be assessed with other units which make up a particular job function.

Evidence Gathering Methods

Evidence should include products, processes and procedures from the workplace context. Evidence might include:

- Observation of the person in the workplace
- Third party reports from a supervisor
- Customer feedback
- Answers to questions about specific skills and knowledge

Resources Required

- A retail work environment
- Relevant documentation, such as:
 - store policy and procedures manuals
 - store merchandising plan
 - legislation and statutory requirements
 - occupational health and safety legislation/regulations/codes of practice
- Access to a work team

WRRO2B

MANAGE SALES AND SERVICE DELIVERY

This unit encompasses the competencies required to monitor, maintain and improve sales and service delivery. It involves market research, developing new markets and marketing products and services within the culture of the overall store policy.

ELEMENTS OF COMPETENCY

PERFORMANCE CRITERIA

1 Maintain and improve operations

- 1.1 Policies and procedures for sales and service delivery implemented, communicated and reviewed on a regular basis.
- 1.2 Resource allocation for client service provision is adequate and maintained in line with store policy.
- 1.3 Customer complaints which have been referred by staff, resolved according to store policy.
- 1.4 Sales and service targets/plans consistent with quality and functional specifications.
- 1.5 Sales and service targets/plans monitored to ensure that customer requirements are met and appropriate remedial action taken if required.
- 1.6 Sales and service targets/plans communicated to relevant personnel according to implementation schedules.
- 1.7 Feedback given to staff on operations and outcomes.
- 1.8 Staff encouraged to take responsibility for meeting customer requirements.
- 1.9 Feedback from customers sought and used to improve future operations.
- 1.10 Corrective measures taken to minimise factors which may cause operations to be disrupted.
- 1.11 Corrective actions monitored and evaluated for effectiveness and used for future operational planning.
- 1.12 Current and accurate records on sales are available to authorised personnel.
- 1.13 Relevant reports interpreted and acted upon as required.

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ELEMENTS OF COMPETENCY

PERFORMANCE CRITERIA

2 Negotiate supply of goods

- 2.1 Arrangements with suppliers negotiated and implemented according to store policies and procedures and communicated to relevant personnel.
- 2.2 Special pricing arrangements and customer payment agreements authorised and communicated to relevant staff and management personnel according to store policy.
- 2.3 Records of suppliers and stock monitored for accuracy and legibility and appropriate action taken where necessary.
- 2.4 Market factors affecting supply identified and communicated to relevant personnel.
- 2.5 Complete and accurate records of negotiations and agreements conveyed to appropriate personnel within designated time limits.
- 2.6 Immediate corrective action taken where potential or actual problems with supply indicated.
- 2.7 New suppliers identified and developed to maintain and improve sales and service delivery.

3 Establish customer requirements

- 3.1 Strategies planned and developed to enhance customer service provision according to store policy.
- 3.2 Customer needs researched and analysed accurately in regard to local geographic and cultural issues.

4 Provide productive work environment

- 4.1 Sufficient supply of resources of the necessary quantity and quality established and maintained to meet customer requirements.
- 4.2 Access to, and use of, resources regulated and monitored for maximum efficiency.
- 4.3 Staff working conditions meet current legislation and store policy.
- 4.4 Maintenance frequency and use of equipment conform to recommended schedules and procedures.
- 4.5 Resources which do not meet requirements replaced, repaired or adapted as soon as is practicable and with minimum disruption to work activity.
- 4.6 Recommendations for improving conditions communicated to relevant personnel within designated time frame.
- 4.7 Complete, accurate records maintained and made available to authorised personnel.

RANGE OF VARIABLES

The Range of Variables provide the range of applications of this unit of competency to allow for differences within enterprises and workplaces. It provides details of practices, knowledge and requirements referred to in the elements and performance criteria. The variables chosen in training and assessment will depend on the work contexts.

The following variables may include but are not limited to:

- Store policies and procedures in regard to:
 - sales and service delivery
- Policies and procedures may involve:
 - service standards
 - staff presentation
 - customer complaints
 - staff induction
 - customer service and sales training
- Sources of supply may include:
 - people
 - external organisations
 - internal departments/teams
- Resources may include:
 - people
 - material
 - equipment/technology
 - financial
 - external consultants
- Customers may include:
 - external
 - internal
- Service and products may include:
 - current
 - potential
- Negotiations may be conducted by:
 - face to face contact
 - correspondence
 - meetings
 - telephone
 - email
- Specifications for services and products may involve:
 - quality
 - quantity
 - coverage/content

Metal and Engineering Training Package

WRRO2B Manage Sales and Service Delivery

- time schedules/scales
- cost

RANGE OF VARIABLES (CONTINUED)

- Specifications may include:
 - customer agreements
 - operational means for meeting agreements
 - specific functional duties within the organisation
- Specifications, recommendations and information may be communicated to:
 - higher level managers
 - subordinates
 - colleagues, specialists, staff from other departments
 - external organisations which have a health, safety or environmental responsibility
 - government bodies
- Feedback may be sought and given:
 - verbally
 - in writing
- Analysis methods may be:
 - quantitative
 - qualitative
- Factors which disrupt operations may include:
 - supply
 - operational resources
 - quality of materials

EVIDENCE GUIDE

The following components of the evidence guide relate directly to the performance criteria and the range of variables for the unit of competency and provide guidance for assessment of the unit in the workplace and/or training program.

Critical Aspects of Evidence

Competency in this unit requires evidence that the candidate:

- Maintains, monitors and evaluates sales and service delivery.
- Communicates sales and service targets/plans and provides feedback on operations and outcomes to relevant personnel.
- Proactively improves sales and service delivery operations.
- Interprets and maintains data on sales and services delivery.
- Negotiates and arranges supply of goods according to store policies and procedures.
- Authorises pricing and payment agreements according to store policies and procedures.
- Maintains, monitors and evaluates supply of stock.

Underpinning Skills and Knowledge

Knowledge and skills are essential to apply this unit in the workplace, to transfer to other contexts and deal with unplanned events. The requirements for this unit of competency are listed below:

Knowledge of:

- Store policies and procedures in regard to:
 - sales and service delivery
 - supply specifications
 - quality assurance and control
 - stock maintenance and control
 - pricing
- Store merchandise and service range
- Store merchandising plan
- Range and availability of new products and services
- Customer demand and market trends
- Product quality standards
- Relevant legislation and statutory requirements
- Relevant industry codes of practice
- Occupational health and safety legislation/regulations/codes of practice
- Pricing procedures including Goods and Services Tax (GST) requirements
- Principles and techniques in:
 - purchasing and supply specifications
 - stock control

EVIDENCE GUIDE (CONTINUED)

Skills in:

- Interpersonal communication skills
- Negotiating with suppliers and customers
- Presentation skills
- Using new technology
- Literacy skills in regard to:
 - researching, analysing and interpreting a broad range of written material
 - preparing reports
 - documenting results
- Numeracy skills in regard to:
 - interpreting and maintaining data

Generic Process Skills

There are a number of processes that are learnt throughout work and life which are required in all jobs. They are fundamental processes and generally transferable to other work functions. Some of these are covered by the **key competencies**, although others may be added. The questions below highlight how these processes are applied in this competency standard. Following each question a number indicates the level to which the key competency needs to be demonstrated where 0 = not required, 1 = perform the process, 2 = perform and administer the process, and 3 = perform, administer and design the process.

Key Competency	Example of Application	Performance Level
How can communication of ideas and information be applied?	By communicating policies and procedures to suppliers, staff and management.	3
How can information be collected, analysed and organised ?	Monitoring sales and service targets/plans requires information to be collected, analysed and organised.	3
How are activities planned and organised ?	Through identifying suppliers, monitoring stock and pricing arrangements.	3
How can team work be applied?	Communicating with staff and maintaining sales and service requires team work.	3
How can the use of mathematical ideas and techniques be applied?	Maintaining sales and service targets/plans requires use of mathematical ideas and techniques.	3
How can problem solving skills be applied?	Identifying and resolving customer complaints requires problem solving skills.	3
How can the use of technology be applied?	Completing accurate records and maintaining equipment requires use of technology.	3

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EVIDENCE GUIDE (CONTINUED)

Context of Assessment

Assessment Process

For valid and reliable assessment of this unit, evidence should be gathered through a range of methods to indicate consistent performance.

It can be gathered from assessment of the unit of competency alone, through an integrated assessment activity or through a combination of both.

Evidence should be gathered as part of the learning process.

Integrated Competency Assessment

Evidence is most relevant when provided through an integrated activity which combines the elements of competency for each unit, or a cluster of units of competency.

The candidate will be required to:

- Apply knowledge and skills which underpin the process required to demonstrate competence, including appropriate key competencies.
- Integrate knowledge and skills critical to demonstrating competence in this unit.

Unit WRRO2B can be assessed with other units that make up a particular job function.

Evidence gathering methods

Evidence should include products, processes and procedures from the workplace context. Evidence might include:

- Observation of the person in the workplace
- Third party reports from a supervisor
- Customer feedback
- Answers to questions about specific skills and knowledge

Resources required

- A retail work environment
- Relevant documentation, such as:
 - store policy and procedures manuals
 - sales and service delivery targets/plans
 - records of sales service
 - legislation and statutory requirements
 - industry codes of practice
 - occupational health and safety legislation/regulations/codes of practice
- Access to suppliers
- Access to a team

WRRO3B

PROVIDE A SAFE WORKING ENVIRONMENT

This unit is based on the National Occupational Health and Safety Commission (NOHSC) guidelines for occupational health and safety. It encompasses the competencies involved in developing and implementing policies and procedures relating to occupational health and safety issues. It involves consulting with staff, assessing and controlling risks, establishing and maintaining record systems and evaluating policies and procedures.

ELEMENTS OF COMPETENCY

PERFORMANCE CRITERIA

1 Develop policies to establish and maintain a safe working environment

- 1.1 Store policies and procedures developed based upon a commitment to occupational health and safety and with regard to relevant legislation.
- 1.2 Occupational health and safety responsibilities and duties clearly defined, allocated and included in job descriptions and duty statements for all relevant positions.
- 1.3 Financial and human resources for the operation of the occupational health and safety system identified, sought and/or provided promptly and consistently.
- 1.4 Information on the occupational health and safety system readily accessible and clearly explained to staff.
- 1.5 Procedures established to identify existing and potential hazards.
- 1.6 Procedures established and maintained to facilitate the reporting of all safety related incidents.
- 1.7 Control measures developed according to the hierarchy of control.
- 1.8 Systems established to encourage staff members to report /identify all matters likely to affect workplace safety.

2 Consult with staff

- 2.1 Appropriate consultation processes established and maintained in consultation with staff according to occupational health and safety legislation and store policy.
- 2.2 Issues raised through consultation dealt with and resolved promptly according to store policy.
- 2.3 Information on outcomes of consultation provided to staff clearly and promptly.

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ELEMENTS OF COMPETENCY	PERFORMANCE CRITERIA
3 Establish and maintain a safe working environment	<p>3.1 Policies and procedures established and maintained to facilitate identification and prevention of hazards.</p> <p>3.2 Identification of potential and existing hazards, addressed at planning, design and evaluation stages of workplace changes to prevent creation of new hazards according to relevant legislation and codes of practice.</p> <p>3.3 Procedures established and maintained to ensure safe handling and storage of hazardous goods.</p> <p>3.4 Procedures established and maintained to ensure equipment is maintained and stored safely in line with store policy.</p> <p>3.5 Procedures established and maintained to ensure safe lifting and manual handling techniques are employed by staff.</p> <p>3.6 Store emergency procedures established and maintained.</p>
4 Assess risks	<p>4.1 Risks presented by identified hazards correctly assessed in accordance with occupational health and safety legislation and codes of practice.</p> <p>4.2 Procedure for ongoing risk assessment developed and integrated with systems of work and procedures.</p> <p>4.3 Staff activities monitored to ensure this procedure is adopted effectively.</p> <p>4.4 Risk identification and assessment addressed at planning, design and evaluation stages of workplace changes to prevent creation of new hazards.</p>
5 Control risks	<p>5.1 Measures to control assessed risks developed according to the hierarchy of control and implemented according to store policy, occupational health and safety legislation and codes of practice.</p> <p>5.2 Interim or contingency measures established and implemented when control measures not immediately practicable, until permanent control measures are implemented.</p>

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ELEMENTS OF COMPETENCY	PERFORMANCE CRITERIA
6 Establish and maintain policies for hazardous events	<p>6.1 Potentially hazardous events correctly identified.</p> <p>6.2 Procedures to control risks associated with hazardous events and meet legislative requirements, developed in consultation with appropriate emergency services.</p> <p>6.3 Appropriate information and training provided to all employees to enable implementation of the correct procedures in all relevant circumstances.</p>
7 Train staff	<p>7.1 Occupational health and safety training program developed and implemented to ensure all staff are trained in occupational health and safety issues.</p>
8 Establish and maintain record system	<p>8.1 System for maintaining occupational health and safety records established and monitored to facilitate identification of patterns of occupational injury and disease according to store policy.</p>
9 Evaluate policies and procedures	<p>9.1 Effectiveness of the occupational health and safety system and related policies, procedures and programs assessed according to store policy.</p> <p>9.2 Improvements to the occupational health and safety system developed and implemented to ensure more effective achievement of store policy.</p> <p>9.3 Compliance with occupational health and safety legislation and codes of practice assessed to ensure that legal occupational health and safety standards are maintained.</p>

RANGE OF VARIABLES

The Range of Variables provide the range of applications of this unit of competency to allow for differences within enterprises and workplaces. It provides details of practices, knowledge and requirements referred to in the elements and performance criteria. The variables chosen in training and assessment will depend on the work contexts.

The following variables may include but are not limited to:

- Store policies and procedures in regard to:
 - occupational health and safety
 - emergency procedures
- Occupational health and safety issues may include:
 - customers and staff, equipment, premises or stock
 - sickness and accident reporting procedures
 - storage and use of flammable materials
 - safe lifting and manual handling procedures
 - store evacuation
 - chemical containment
 - first aid procedures
 - range of responsibilities/job description including general duty of care of employees and employers
 - workplace inspection and safety audits
 - checking equipment prior to and during work
 - reporting process for and issues resolution, injury or accidents
- Store emergency procedures may include:
 - locating and using alarms
 - events likely to endanger staff or customers
 - sickness
 - accidents
 - fire
 - store evacuation
 - chemical spills
 - bomb scares
 - armed robbery
- Processes for consultation may include:
 - minutes from health and safety meetings
 - suggestions for improvements put forward by employees
 - staff meetings, management meetings
- Assessing risks may include:
 - conducting regular reviews of injury/accident registers
 - consultation processes including discussions with employees
 - maintenance of plant and equipment
 - assessment of individual tasks and job design

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RANGE OF VARIABLES (CONTINUED)

- Hierarchy of control may include:
 - elimination of hazards
 - substitution
 - isolating hazards
 - use of engineering controls
 - use of administrative controls
 - appropriate use of personal protective clothing and equipment
- Staff training may include:
 - induction training
 - training for specific hazards identified in the industry
 - fire and emergency evacuation training
 - ongoing professional development training which includes occupational health and safety implications
- Training may be provided to trainees:
 - on the job
 - off the job
 - combination of both
- Records may include:
 - workplace inspection and audit reports
 - training records for new employees
 - ongoing employee training records
 - manufacturer's instructions including MSDS maintenance records
 - revision of policies and procedures to ensure relevance through audits against State and Territory legislation and regulations

EVIDENCE GUIDE

The following components of the evidence guide relate directly to the performance criteria and the range of variables for the unit of competency and provide guidance for assessment of the unit in the workplace and/or training program.

Critical Aspects of Evidence

Competency in this unit requires evidence that the candidate:

- Maintains, manages and applies safe work practices including necessary resources, control measures and risk assessments, in all areas of the store, according to occupational health and safety, and health and hygiene legislation/regulations/industry codes of practice and equal opportunity principles.
- Maintains, manages and applies emergency procedures according to store policies and procedures.
- Develops and/or manages store policies and procedures in regard to the consistent application by staff members of safe working practices, for the provision of services and safe use of products.
- Establishes and maintains consultative processes in regard to occupation health and safety legislation/regulations/industry codes of practice.
- Allocates and manages staff responsibilities for occupational health and safety guidelines and health and hygiene legislation/regulations and industry codes of practice.
- Develops and implements staff training programs that relate to occupational health and safety, and health and hygiene legislation/regulations and industry codes of practice.
- Establishes and maintains a recording system for accident, illness and emergency situations details.
- Evaluates, reviews and makes recommendations for improvements with regard to store policies and procedures in occupational health and safety and store emergency procedures

Underpinning Skills and Knowledge

Knowledge and skills are essential to apply this standard in the workplace, to transfer to other contexts and deal with unplanned events. The requirements for this unit of competency are listed on the following page:

Knowledge of:

Metal and Engineering Training Package

WRRO3B Provide a Safe Working Environment

- Store policies and procedures, in regard to:
 - occupational health and safety and emergency procedures, taking into account local and state government legislation/regulations/codes of practice
 - emergency evacuation of store
 - events likely to endanger staff or customers
 - hierarchy of control in emergency situations
 - place of consultative committees
 - recording system for accidents, incidents, illness
- Relevant occupational health and safety legislation/regulations/codes of practice
- Relevant legislation and statutory requirements
- Relevant industry codes of practice
- First aid procedures
- Handling and storage procedures of hazardous and non hazardous goods and equipment
- Procedures for spills/leakage of materials/accidents/sickness
- Safe lifting and manual handling procedures
- Waste disposal methods, including hazardous substances

EVIDENCE GUIDE (CONTINUED)

Skills in:

- Consultation processes
- Identifying and preventing fire and safety hazards, including fire/chemical/electrical hazards
- Negotiation skills
- Using safety alarms/fire extinguishers/emergency exits
- Developing processes and procedures
- Literacy skills in regard to:
 - researching, analysing and interpreting a broad range of written material
 - preparing reports
 - documenting results
- Numeracy skills in relation to:
 - finance and risk assessment

Generic Process Skills

There are a number of processes that are learnt throughout work and life which are required in all jobs. They are fundamental processes and generally transferable to other work functions. Some of these are covered by the **key competencies**, although others may be added. The questions below highlight how these processes are applied in this unit of competency. Following each question a number indicates the level to which the key competency needs to be demonstrated where 0 = not required, 1 = perform the process, 2 = perform and administer the process, and 3 = perform, administer and design the process.

Key Competency	Example of Application	Performance Level
How can communication of ideas and information be applied?	Policies and procedures need to be communicated to all staff members.	3
How can information be collected, analysed and organised ?	Identifying existing and potential hazards requires information to be collected, analysed and organised.	3
How are activities planned and organised ?	Developing a training program requires activities to be planned and organised.	3
How can team work be applied?	Team work will be applied when consulting with staff on workplace safety.	3
How can the use of mathematical ideas and techniques be applied?	The use of mathematical ideas and techniques will be applied when identifying patterns of occupational injury and disease.	2
How can problem solving skills be applied?	Problem solving skills will be applied when establishing contingency measures until permanent control measures are implemented.	3

Metal and Engineering Training Package

WRRO3B Provide a Safe Working Environment

How can the use of technology be applied?	The use of technology will be applied when establishing and maintaining record systems.	3
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EVIDENCE GUIDE (CONTINUED)

Context of Assessment

Assessment Process

For valid and reliable assessment of this unit, evidence should be gathered through a range of methods to indicate consistent performance.

It can be gathered from assessment of the unit of competency alone, through an integrated assessment activity or through a combination of both.

Evidence should be gathered as part of the learning process.

Integrated Competency Assessment

Evidence is most relevant when provided through an integrated activity which combines the elements of competency for each unit, or a cluster of units of competency.

The candidate will be required to:

- Apply knowledge and skills which underpin the process required to demonstrate competence, including appropriate key competencies.
- Integrate knowledge and skills critical to demonstrating competence in this unit.

Unit WRRO3B can be assessed with the following units:

WRRPM1B Administer human resources policy

WRRPM2B Recruit and select personnel

Evidence Gathering Methods

Evidence should include products, processes and procedures from the workplace context or a simulated environment. Evidence might include:

- Observation of the person in the workplace
- Simulated role play
- Third party reports from a supervisor
- Customer feedback
- Answers to questions about specific skills and knowledge

Resources Required

- A real or simulated work environment
- Relevant documentation, such as:
 - occupational health and safety legislation/regulations/codes of practice
 - store policy and procedures manuals
 - industry codes of practice
 - enterprise agreements in regard to consultative committees
- Access to other staff members
- Access to emergency equipment

WRRO4B

CONTROL STORE SECURITY/LOSS

This unit involves the skills and knowledge required to control store security. It involves developing and implementing security procedures for the prevention of theft, ensuring safety of all personnel in the event of a robbery and monitoring all security procedures.

ELEMENTS OF COMPETENCY	PERFORMANCE CRITERIA
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- | | |
|---------------------------------|--|
| 1 Control store security | <ul style="list-style-type: none">1.1 Security procedures to facilitate the detection and prevention of internal or external theft developed and implemented according to store policy.1.2 Procedures to ensure maximum safety and security for all personnel in the event of robbery developed and implemented.1.3 Procedures for opening and closing premises and cash registers, cash security, credit card and cheque transactions developed and implemented.1.4 Security procedures monitored, maintained and communicated to all staff.1.5 Stocktaking procedures established and implemented to monitor, control and minimise stock losses. |
|---------------------------------|--|

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RANGE OF VARIABLES

The Range of Variables provide the range of applications of this unit of competency to allow for differences within enterprises and workplaces. It provides details of practices, knowledge and requirements referred to in the elements and performance criteria. The variables chosen in training and assessment will depend on the work contexts.

The following variables may include but are not limited to:

- Store policies and procedures in regard to:
 - security
- Type of security equipment in regard to:
 - type of equipment used
 - level of security required
- Theft may involve:
 - internal personnel
 - external personnel
- Security procedures/equipment may include:
 - dye tags
 - alarms
 - locks
 - security cameras
 - security guards

EVIDENCE GUIDE

The following components of the evidence guide relate directly to the performance criteria and the range of variables for the unit of competency and provide guidance for assessment of the unit in the workplace and/or training program.

Critical Aspects of Evidence

Competency in this unit requires evidence that the candidate:

- Develops and implements security procedures to facilitate the detection and prevention of theft.
- Develops and implements procedures to ensure safety and security of internal and external clients in the event of robbery.
- Develops and implements procedures for:
 - opening and closing premises
 - cash security
 - credit card transactions, EFTPOS
 - cheque transactions
 - stocktaking to control and minimise theft.

Underpinning Skills and Knowledge

Knowledge and skills are essential to apply this unit in the workplace, to transfer to other contexts and deal with unplanned events. The requirements for this unit of competency are listed below:

Knowledge of:

- Store policies and procedures, in regard to:
 - security
 - detection and apprehension of thieves
 - credit card transactions
 - cheque transactions
 - stocktaking
- Relevant legislation and statutory requirements, including
 - case law or common law
 - state laws relating to property offences
- Relevant industry codes of practice
- Occupational health and safety legislation/regulations/codes of practice
- Principles and techniques in:
 - safety of personnel in the event of robbery
 - detection and prevention of theft

Skills in:

- Negotiation
- Record maintenance
- Development of procedures
- Interpersonal communication skills

EVIDENCE GUIDE (CONTINUED)**Generic Process Skills**

There are a number of processes that are learnt throughout work and life which are required in all jobs. They are fundamental processes and generally transferable to other work functions. Some of these are covered by the **key competencies**, although others may be added. The questions below highlight how these processes are applied in this unit of competency. Following each question a number indicates the level to which the key competency needs to be demonstrated where 0 = not required, 1 = perform the process, 2 = perform and administer the process, and 3 = perform, administer and design the process.

Key Competency	Example of Application	Performance Level
How can communication of ideas and information be applied?	Security procedures need to be communicated to all personnel.	3
How can information be collected, analysed and organised ?	The development of security procedures requires information to be collected, analysed and organised.	3
How are activities planned and organised ?	Stocktaking procedures to minimise stock losses requires activities to be planned and organised.	3
How can team work be applied?	Team work will be applied when implementing and communicating store security procedures.	3
How can the use of mathematical ideas and techniques be applied?	Mathematical ideas and techniques will be applied during stocktaking procedures.	2
How can problem solving skills be applied?	Problem solving skills will be applied when developing security procedures to facilitate the detection and prevention of internal or external theft.	3
How can the use of technology be applied?	The use of technology will be applied through the use of security equipment, registers and credit card facilities.	3

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EVIDENCE GUIDE (CONTINUED)

Context of Assessment

Assessment Process

For valid and reliable assessment of this unit, evidence should be gathered through a range of methods to indicate consistent performance.

It can be gathered from assessment of the unit of competency alone, through an integrated assessment activity or through a combination of both.

Evidence should be gathered as part of the learning process.

Integrated Competency Assessment

Evidence is most relevant when provided through an integrated activity which combines the elements of competency for each unit, or a cluster of units of competency.

The candidate will be required to:

- Apply knowledge and skills which underpin the process required to demonstrate competence, including appropriate key competencies.
- Integrate knowledge and skills critical to demonstrating competence in this unit.

Unit WRRO4B can be assessed with other units which make up a particular job function.

Evidence Gathering Methods

Evidence should include products, processes and procedures from the workplace context or from a simulated work environment. Evidence might include:

- Observation of the person in the workplace
- A simulated role play
- Third party reports from a supervisor
- Customer feedback
- Answers to questions about specific skills and knowledge

Resources Required

- A real or simulated work environment
- Relevant documentation, such as:
 - store policy and procedures on security
 - store policy and procedures on credit card transactions and cheque transactions
 - store policy and procedures on stocktaking
 - legislation and statutory requirements
 - industry codes of practice
 - occupational health and safety legislation/regulations/codes of practice
- Access to a team
- Access to a range of security equipment

WRRO5B

CONTROL INVENTORY

This unit covers the skills and knowledge required to control inventory in a retail environment. It involves managing receipt, dispatch and storage of merchandise, and managing stock control.

ELEMENTS OF COMPETENCY

PERFORMANCE CRITERIA

- | | | |
|----------|--|--|
| 1 | Manage receipt, dispatch and storage of merchandise | 1.1 Merchandise received, dispatched and stored according to store policies and procedures.
1.2 Cost effective and efficient methods for goods movement determined according to store policy.
1.3 Maintenance procedures for storage areas and equipment implemented according to store policy. |
| 2 | Manage stock control | 2.1 Store policies and procedures implemented in regard to stock control and inventories.
2.2 Store procedures established and implemented to monitor and control stock levels.
2.3 Budgeted stock levels maintained.
2.4 Stocktaking procedures established and implemented.
2.5 Contingency plans established and implemented in regard to stock delivery times.
2.6 Reports on stock inventories accurately documented and prepared. |

RANGE OF VARIABLES

The Range of Variables provide the range of applications of this unit of competency to allow for differences within enterprises and workplaces. It provides details of practices, knowledge and requirements referred to in the elements and performance criteria. The variables chosen in training and assessment will depend on the work contexts.

The following variables may include but are not limited to:

- Store policies and procedures in regard to:
 - receipt of goods from suppliers
 - dispatch of goods
 - shrinkage prevention
 - waste controls
 - safety controls
 - secure storage
 - stock control and inventories
- Stocktaking procedures may include:
 - stock control
 - stock levels
 - cyclical counts
 - minimisation of out of date stock
 - quality control
- Contingency plans may include:
 - breakdowns
 - delays
 - floods
 - breakages

EVIDENCE GUIDE

The following components of the evidence guide relate directly to the performance criteria and the range of variables for the unit of competency and provide guidance for assessment of the unit in the workplace and/or training program.

Critical Aspects of Evidence

Competency in this unit requires evidence that the candidate:

- Plans, coordinates and implements activities associated with receipt, dispatch, storage and movement of merchandise according to store policies and procedures, including occupational health and safety policies and guidelines.
- Implements maintenance procedures for storage areas and equipment according to store policy.
- Plans, coordinates and implements activities associated with stock control, including:
 - monitoring and controlling stock levels
 - establishing and maintaining stocktaking procedures
 - documenting and reporting on inventories according to store policies and procedures.

Underpinning Skills and Knowledge

Knowledge and skills are essential to apply this unit in the workplace, to transfer to other contexts and deal with unplanned events. The requirements for this unit of competency are listed below:

Knowledge of:

- Store policies and procedures, in regard to:
 - receipt of goods from suppliers
 - dispatch of goods
 - shrinkage prevention
 - waste controls
 - safety controls
 - secure storage in an appropriate environment
 - equipment used to move stock
- Store systems and equipment for stock recording and control
- Inventory control
- Storage security
- Licensing requirements for operating moving equipment (if applicable)
- Relevant legislation and statutory requirements
- Relevant industry codes of practice
- Occupational health and safety legislation/regulations/codes of practice

Skills in:

- Stocktaking procedures
- Record maintenance
- Literacy skills in regard to:
 - documenting and recording procedures
- Numeracy skills in regard to:
 - interpreting data and cost effectiveness/efficiency

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EVIDENCE GUIDE (CONTINUED)**Generic Process Skills**

There are a number of processes that are learnt throughout work and life which are required in all jobs. They are fundamental processes and generally transferable to other work functions. Some of these are covered by the **key competencies**, although others may be added. The questions below highlight how these processes are applied in this unit of competency. Following each question a number indicates the level to which the key competency needs to be demonstrated where 0 = not required, 1 = perform the process, 2 = perform and administer the process, and 3 = perform, administer and design the process.

Key Competency	Example of Application	Performance Level
How can communication of ideas and information be applied?	Implementing stock taking procedures requires communication of ideas and information.	3
How can information be collected, analysed and organised ?	Establishing procedures to monitor and control stock levels requires information to be collected, analysed and organised.	3
How are activities planned and organised ?	Developing contingency plans requires activities to be planned and organised.	3
How can team work be applied?	Team work will be required to implement store policies and procedures in regard to stock control.	3
How can the use of mathematical ideas and techniques be applied?	Mathematical ideas and techniques will be applied when developing reports on stock inventories.	3
How can problem solving skills be applied?	Developing contingency plans in regard to stock delivery times will require problem solving skills.	3
How can the use of technology be applied?	The use of technology will be applied when developing reports on stock inventories.	3

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EVIDENCE GUIDE (CONTINUED)

Context of Assessment

Assessment Process

For valid and reliable assessment of this unit, evidence should be gathered through a range of methods to indicate consistent performance.

It can be gathered from assessment of the unit of competency alone, through an integrated assessment activity or through a combination of both.

Evidence should be gathered as part of the learning process.

Integrated Competency Assessment

Evidence is most relevant when provided through an integrated activity which combines the elements of competency for each unit, or a cluster of units of competency.

The candidate will be required to:

- Apply knowledge and skills which underpin the process required to demonstrate competence, including appropriate key competencies.
- Integrate knowledge and skills critical to demonstrating competence in this unit.

Unit WRRO5B can be assessed with other units which make up a particular job function.

Evidence Gathering Methods

Evidence should include products, processes and procedures from the workplace context. Evidence might include:

- Observation of the person in the workplace
- Third party reports from a supervisor
- Customer feedback
- Answers to questions about specific skills and knowledge

Resources Required

- A retail work environment
- Relevant documentation, such as:
 - store policies and procedures on inventory control
 - legislation and statutory requirement
 - industry codes of practice
 - occupational health and safety legislation/regulations/codes of practice
- Access to:
 - a stock control system
 - stock control equipment
 - a team

WRRO6B

MANAGE STORE FACILITIES

This unit encompasses the competencies required to manage store facilities in a retail environment. It involves the management of the store maintenance and housekeeping program, negotiating and monitoring maintenance contracts and identifying and locating facilities requirements.

ELEMENTS OF COMPETENCY	PERFORMANCE CRITERIA
1 Manage store maintenance program	<ul style="list-style-type: none">1.1 Premises, fittings, fixtures and equipment monitored and maintained according to store policy.1.2 Deficiencies in store maintenance procedures identified and remedial action taken.1.3 Expert or specialist advice obtained as required according to store policy.1.4 Contingency plan initiated in the event of maintenance problems.
2 Manage retail equipment maintenance	<ul style="list-style-type: none">2.1 Policies and procedures developed and implemented to ensure retail equipment maintained according to store policy.2.2 Maintenance program for retail equipment monitored and implemented according to manufacturer's design specifications and store policy.2.3 Equipment faults identified and rectified where possible, without undue delay.2.4 Equipment faults or failures reported according to service agreements and store policy.
3 Negotiate maintenance contracts	<ul style="list-style-type: none">3.1 Maintenance contracts with contractors and suppliers negotiated according to store policies and procedures.3.2 Contract terms and conditions negotiated and implemented to maximise benefits for the store, and communicated to relevant staff.3.3 Maintenance procedures monitored to ensure products/tasks meet contract specifications.
4 Identify facilities/space requirements	<ul style="list-style-type: none">4.1 Facilities/space requirements identified according to store policy and budget requirements.4.2 Suitable facilities/space located.4.3 Space utilisation maximised with consideration to existing configuration.

RANGE OF VARIABLES

The Range of Variables provide the range of applications of this unit of competency to allow for differences within enterprises and workplaces. It provides details of practices, knowledge and requirements referred to in the elements and performance criteria. The variables chosen in training and assessment will depend on the work contexts.

The following variables may include but are not limited to:

- Store policies and procedures in regard to:
 - store maintenance
 - facilities management
- Contracts may be negotiated:
 - externally
 - internally
- Contracts may involve:
 - quality standards
 - maintenance services
 - cleaning
 - security
 - electrical services
 - plumbing services
 - equipment maintenance
- Recording methods may include:
 - electronic
 - manual
- Reporting of faults may include:
 - service personnel
 - contractors
 - store/area manager
 - supervisor
- Retail equipment may include:
 - point of sale terminals
 - computers/scanners/printers
 - pricing equipment
 - electronic bar coding equipment
 - portable data entry

EVIDENCE GUIDE

The following components of the evidence guide relate directly to the performance criteria and the range of variables for the unit of competency and provide guidance for assessment of the unit in the workplace and/or training program.

Critical Aspects of Evidence

Competency in this unit requires evidence that the candidate:

- Plans, coordinates and implements activities associated with monitoring and maintaining premises, fittings, fixtures and equipment according to store policies and procedures.
- Initiates contingency plans in response to maintenance problems.
- Negotiates, monitors and implements maintenance contracts according to store policies and procedures.
- Identifies and utilises space and facilities to maximise space utilisation.
- Evaluates and reports on effectiveness of maintenance contracts.

Underpinning Skills and Knowledge

Knowledge and skills are essential to apply this unit in the workplace, to transfer to other contexts and deal with unplanned events. The requirements for this unit of competency are listed below:

Knowledge of:

- Store policies and procedures, in regard to:
 - maintenance of store facilities
 - maintenance of retail equipment
- Maintenance contract terms and options
- Contract specifications
- Relevant legislation and statutory requirements
- Relevant industry codes of practice
- Occupational health and safety legislation/regulations/codes of practice
- Principles and techniques in:
 - monitoring performance of contracts
 - negotiating, in particular contract negotiation

Skills in:

- Record maintenance
- Negotiation skills
- Literacy skills in regard to:
 - developing, documenting and recording procedures
- Numeracy skills in regard to:
 - accounting and recording data

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EVIDENCE GUIDE (CONTINUED)**Generic Process Skills**

There are a number of processes that are learnt throughout work and life which are required in all jobs. They are fundamental processes and generally transferable to other work functions. Some of these are covered by the **key competencies**, although others may be added. The questions below highlight how these processes are applied in this unit of competency. Following each question a number indicates the level to which the key competency needs to be demonstrated where 0 = not required, 1 = perform the process, 2 = perform and administer the process, and 3 = perform, administer and design the process.

Key Competency	Example of Application	Performance Level
How can communication of ideas and information be applied?	Negotiating maintenance contracts with contractors requires information and ideas to be communicated.	3
How can information be collected, analysed and organised ?	Identifying facilities/space requirements requires information to be collected, analysed and organised.	3
How are activities planned and organised ?	Developing a maintenance program for retail equipment requires activities to be planned and organised.	3
How can team work be applied?	Team work will be applied when seeking expert advice for maintenance program and communicating with relevant staff.	3
How can the use of mathematical ideas and techniques be applied?	The use of mathematical ideas and techniques will be applied when identifying budget requirements.	2
How can problem solving skills be applied?	Problem solving skills will be applied when rectifying equipment faults.	3
How can the use of technology be applied?	The use of technology will be applied when developing contracts and maintaining retail equipment.	3

Context of Assessment**Assessment process**

For valid and reliable assessment of this unit, evidence should be gathered through a range of methods to indicate consistent performance.

It can be gathered from assessment of the unit of competency alone, through an integrated assessment activity or through a combination of both.

Evidence should be gathered as part of the learning process.

EVIDENCE GUIDE (CONTINUED)

Evidence is most relevant when provided through an integrated activity which combines the elements of competency for each unit, or a cluster of units of competency.

The candidate will be required to:

- Apply knowledge and skills which underpin the process required to demonstrate competence, including appropriate key competencies.
- Integrate knowledge and skills critical to demonstrating competence in this unit.

Unit WRRO6B can be assessed with other units which make up a particular job function.

Evidence Gathering Methods

Evidence should include products, processes and procedures from the workplace context. Evidence might include:

- Observation of the person in the workplace
- Third party reports from a supervisor
- Customer feedback
- Answers to questions about specific skills and knowledge

Resources Required

- A retail work environment
- Relevant documentation, such as:
 - maintenance contracts
 - store policies and procedures on maintenance of facilities, maintenance contracts
 - legislation and statutory requirements
 - industry codes of practice
 - occupational health and safety legislation/regulations/codes of practice
- Access to a team
- Access to equipment/technology

WRRS1B

SELL PRODUCTS AND SERVICES

This unit involves the skills, knowledge and attitudes required to sell products and services in a retail environment. It involves the use of sales techniques and encompasses the key selling skills from approaching the customer to closing the sale. It requires a basic level of product knowledge.

ELEMENTS OF COMPETENCY

PERFORMANCE CRITERIA

- | | |
|----------------------------------|--|
| 1 Apply product knowledge | 1.1 Knowledge of the use and application of relevant products and services demonstrated according to store policy and legislative requirements.
1.2 Product knowledge developed by accessing relevant sources in information. |
| 2 Approach customer | 2.1 Timing of customer approach determined and applied.
2.2 Effective sales approach identified and applied.
2.3 Positive impression conveyed to arouse customer interest.
2.4 Knowledge of customer buying behaviour demonstrated. |
| 3 Gather information | 3.1 Questioning techniques applied to determine customer buying motives.
3.2 Listening skills used to determine customer requirements.
3.3 Non-verbal communication cues interpreted and clarified.
3.4 Customers identified by name where possible.
3.5 Customer directed to specific merchandise. |
| 4 Sell benefits | 4.1 Customer needs matched to appropriate products and services.
4.2 Knowledge of products' features and benefits communicated clearly to customers.
4.3 Product use and safety requirements described to customers.
4.4 Customers referred to appropriate product specialist as required.
4.5 Routine customer questions about merchandise are answered accurately and honestly or referred to more experienced senior sales staff. |

ELEMENTS OF COMPETENCY	PERFORMANCE CRITERIA
5 Overcome objections	<p>5.1 Customer objections identified and accepted.</p> <p>5.2 Objections categorised into price, time and merchandise characteristics.</p> <p>5.3 Solutions offered according to store policy.</p> <p>5.4 Problem solving applied to overcome customer objections.</p>
6 Close sale	<p>6.1 Customer buying signals monitored, identified and responded to appropriately.</p> <p>6.2 Customer encouraged to make purchase decisions.</p> <p>6.3 Appropriate method of closing sale selected and applied.</p>
7 Maximise sales opportunities	<p>7.1 Opportunities for making additional sales recognised and applied.</p> <p>7.2 Customer advised of complementary products or services according to customer's identified need.</p> <p>7.3 Personal sales outcomes reviewed to maximise future sales.</p>

RANGE OF VARIABLES

The Range of Variables provide the range of applications of this unit of competency to allow for differences within enterprises and workplaces. It provides details of practices, knowledge and requirements referred to in the elements and performance criteria. The variables chosen in training and assessment will depend on the work contexts.

The following variables may include but are not limited to:

- Store policy and procedures in regard to:
 - selling products and services
- Customers may include:
 - people with routine or special needs
 - regular or new customers
 - people from a range of social, cultural or ethnic backgrounds and physical and mental abilities
- Product knowledge may include:
 - warranties
 - features and benefits
 - use by dates
 - handling/storage requirements
 - stock availability
 - safety features
 - price
- Selling may involve:
 - face to face
 - over the telephone
 - over the Internet
- Routine customer questions may relate to:
 - price and price reductions
 - quality
 - features and benefits
- Legislative requirements may include:
 - Trade Practices Act
 - tobacco laws
 - liquor laws
 - sale of second hand goods
 - occupational health and safety
 - industry codes of practice
 - Lottery Acts
- Relevant sources of information may include:
 - Internet
 - relevant staff members
 - store or supplier product manuals
 - product profiles
 - videos
 - demonstrations
 - labels
 - store tours

EVIDENCE GUIDE

The following components of the evidence guide relate directly to the performance criteria and the range of variables for the unit of competency and provide guidance for assessment of the unit in the workplace and/or training program.

Critical Aspects of Evidence

Competency in this unit requires evidence that the candidate:

- Applies product knowledge and uses appropriate sales approach to sell the benefits of products, overcome objections and close sales.
- Uses questioning, listening and observation skills to determine customer requirements.
- Consistently applies store policies and procedures in regard to selling products and services.
- Maximises sales opportunities according to store policies and procedures.
- Consistently applies industry codes of practice, relevant legislation and statutory requirements in regard to selling products and services.
- Evaluates personal sales performance to maximise future sales.

Underpinning Skills and Knowledge

Knowledge and skills are essential to apply this unit in the workplace, to transfer to other contexts and deal with unplanned events. The requirements for this unit of competency are listed below:

Knowledge of:

- Store policies and procedures, in regard to:
 - selling products and services
 - allocated duties and responsibilities
- Store merchandise and service range
- Specific product knowledge for area/section
- Relevant legislation and statutory requirements
- Relevant industry codes of practice
- Customer types and needs including:
 - customer buying motives
 - customer behavior and cues
 - individual and cultural differences
 - demographics/lifestyle/income
 - types of customer needs, eg functional, psychological

Skills in:

- Selling techniques including:
 - opening techniques
 - buying signals
 - strategies to focus customer on specific merchandise
 - add ons and complimentary sales
 - overcoming customer objections
 - closing techniques

EVIDENCE GUIDE (CONTINUED)

- Verbal and non verbal communication skills
- Handling difficult customers
- Negotiation skills
- Sales performance appreciation
- Questioning/listening/observation
- Literacy skills in regard to:
 - reading and understanding product information
 - reading and understanding store policies and procedures
 - recording information
- Numeracy skills in regard to:
 - handling of tender
 - weighing and measuring goods

Generic Process Skills

There are a number of processes that are learnt throughout work and life which are required in all jobs. They are fundamental processes and generally transferable to other work functions. Some of these are covered by the **key competencies**, although others may be added. The questions below highlight how these processes are applied in this unit of competency. Following each question a number indicates the level to which the key competency needs to be demonstrated where 0 = not required, 1 = perform the process, 2 = perform and administer the process, and 3 = perform, administer and design the process.

Key Competency	Example of Application	Performance Level
How can communication of ideas and information be applied?	Relaying product features and benefits to customers requires the communication of ideas and information.	1
How can information be collected, analysed and organised ?	Establishing customer requirements requires information to be collected, analysed and organised.	1
How are activities planned and organised ?	Identifying opportunities to make additional sales requires activities to be planned and organised.	1
How can team work be applied?	Team work will be applied when referring to other staff members or seeking product information.	1
How can the use of mathematical ideas and techniques be applied?	Mathematical ideas and techniques may be required when reviewing personal sales outcomes.	1
How can problem solving skills be applied?	Problem solving skills may be applied when overcoming customer objections.	1

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WRRS1B Sell Products and Services

How can the use of technology be applied?	The use of technology may not be required in this unit.	0
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EVIDENCE GUIDE (CONTINUED)

Context of Assessment

Assessment Process

For valid and reliable assessment of this unit, evidence should be gathered through a range of methods to indicate consistent performance.

It can be gathered from assessment of the unit of competency alone, through an integrated assessment activity or through a combination of both.

Evidence should be gathered as part of the learning process.

Integrated Competency Assessment

Evidence is most relevant when provided through an integrated activity which combines the elements of competency for each unit, or a cluster of units of competency.

The candidate will be required to:

- Apply knowledge and skills which underpin the process required to demonstrate competence, including appropriate key competencies.
- Integrate knowledge and skills critical to demonstrating competence in this unit.

Unit WRRS1B can be assessed with other units which make up a specific job function.

Evidence Gathering Methods

Evidence should include products, processes and procedures from the workplace context. Evidence might include:

- Observation of the person in the workplace
- Third party reports from a supervisor
- Customer feedback
- Answers to questions about specific skills and knowledge

Resources Required

- A retail work environment
- Relevant documentation, such as:
 - store policy and procedures manuals
- Access to a range of customers with different requirements
- A range of merchandise and products appropriate to the retail workplace
- Product labels and sources of product information

WRRS2B

ADVISE ON PRODUCTS AND SERVICES

This unit builds on unit WRRS1B Sell products and services. It requires a greater depth of specialist or general product knowledge and a greater need for experience and skill in offering advice to customers.

ELEMENTS OF COMPETENCY

PERFORMANCE CRITERIA

1 Develop product/service knowledge

- 1.1 Product knowledge developed and maintained according to store policy and legislative requirements.
- 1.2 Product knowledge conveyed to other staff members as required.
- 1.3 Comparisons between products and services researched and applied.
- 1.4 Knowledge of competitors' product and service range and pricing structure demonstrated.

2 Recommend specialised products/services

- 2.1 Merchandise evaluated according to customer requirements.
- 2.2 Features and benefits of products and services demonstrated to customer to create a buying environment.
- 2.3 Detailed specialised knowledge of product applied to provide accurate advice to customers.

RANGE OF VARIABLES

The Range of Variables provide the range of applications of this unit of competency to allow for differences within enterprises and workplaces. It provides details of practices, knowledge and requirements referred to in the elements and performance criteria. The variables chosen in training and assessment will depend on the work contexts.

The following variables may include but are not limited to:

- Store policy and procedures in regard to:
 - selling products and services
- Legislative requirements may include:
 - Trade Practices Act
 - tobacco laws
 - liquor laws
 - Lottery Acts
 - industry codes of practice
 - occupational health and safety
 - sale of second hand goods
 - sale of X and R rated products
 - trading hours
 - transport, storage and handling of goods
- Product knowledge may include:
 - brand options
 - product features/benefits
 - warranties
 - safety features
- Product knowledge may be developed and maintained by:
 - accessing the Internet
 - attending product launches
 - attending product seminars
 - discussions with staff members
 - accessing product information booklets/pamphlets
- Pricing structure may include:
 - sales reductions
 - pricing procedures including Goods and Services Tax (GST) requirements
 - mark downs
- Customers may include:
 - people with routine or special requests
 - people with special needs
 - regular and new customers
 - people from a range of social, cultural or ethnic backgrounds and physical and mental abilities
- Customer requirements may include:
 - specific brand
 - sizing
 - quality
 - quantity
 - price range
 - usage

EVIDENCE GUIDE

The following components of the evidence guide relate directly to the performance criteria and the range of variables for the unit of competency and provide guidance for assessment of the unit in the workplace and/or training program.

Critical Aspects of Evidence

Competency in this unit requires evidence that the candidate:

- Consistently applies store policies and procedures and industry codes of practice in regard to customer service and selling products and services.
- Develops, maintains and conveys product knowledge to customers.
- Applies detailed and specialised product knowledge to provide accurate advice according to the needs of the customer.

Underpinning Skills and Knowledge

Knowledge and skills are essential to apply this unit in the workplace, to transfer to other contexts and deal with unplanned events. The requirements for this unit of competency are listed below:

Knowledge of:

- Specialised product knowledge including:
 - warranties
 - benefits and features
 - shelf life/use by date
 - storage requirements
 - ingredients or materials contained in product
 - product/ingredient origins
 - care and handling of products
 - corresponding or complementary products and services
 - stock availability
- Store/industry manuals and documentation
- Stock and merchandise range
- Service range
- Procedures for taking orders
- Pricing procedures including Goods and Services Tax (GST) requirements
- Other relevant policies and procedures
- Relevant legislation and statutory requirements
- Relevant industry codes of practice

EVIDENCE GUIDE (CONTINUED)

Skills in:

- Interpersonal communication skills
- Using a range of communication/electronic equipment
- Accessing relevant product/service information
- Literacy skills in regard to:
 - reading and understanding product information
 - reading and understanding store policies and procedures
 - recording information
- Numerical skills in regard to:
 - estimating and calculating costs relevant to pricing products

Generic Process Skills

There are a number of processes that are learnt throughout work and life which are required in all jobs. They are fundamental processes and generally transferable to other work functions. Some of these are covered by the **key competencies**, although others may be added. The questions below highlight how these processes are applied in this unit of competency. Following each question a number indicates the level to which the key competency needs to be demonstrated where 0 = not required, 1 = perform the process, 2 = perform and administer the process, and 3 = perform, administer and design the process.

Key Competency	Example of Application	Performance Level
How can communication of ideas and information be applied?	Recommending specialised products to customers requires ideas and information to be communicated.	2
How can information be collected, analysed and organised ?	Developing product knowledge requires information to be collected, analysed and organised.	2
How are activities planned and organised ?	Developing knowledge of competitor's products and services may require activities to be planned and organised.	1
How can team work be applied?	Team work may be required when developing and relaying product knowledge to other team members.	1
How can the use of mathematical ideas and techniques be applied?	Making comparisons with competitor's pricing structure will require the use of mathematical ideas and techniques.	2
How can problem solving skills be applied?	Problem solving will be applied when evaluating merchandise according to customer requirements.	2

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WRRS1B Sell Products and Services

How can the use of technology be applied?	The use of technology will be applied when developing product knowledge through accessing the Internet.	2
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EVIDENCE GUIDE (CONTINUED)

Context of Assessment

Assessment process

For valid and reliable assessment of this unit, evidence should be gathered through a range of methods to indicate consistent performance.

It can be gathered from assessment of the unit of competency alone, through an integrated assessment activity or through a combination of both.

Evidence should be gathered as part of the learning process.

Integrated Competency Assessment

Evidence is most relevant when provided through an integrated activity which combines the elements of competency for each unit, or a cluster of units of competency.

The candidate will be required to:

- Apply knowledge and skills which underpin the process required to demonstrate competence, including appropriate key competencies.
- Integrate knowledge and skills critical to demonstrating competence in this unit.

Unit WRRS2B can be assessed with other units which relate to the specific job function.

Evidence Gathering Methods

Evidence should include products, processes and procedures from the workplace context. Evidence might include:

- Observation of the person in the workplace
- Third party reports from a supervisor
- Customer feedback
- Answers to questions about specific skills and knowledge

Resources Required

- A retail work environment
- Access to a range of stock and merchandise
- Relevant documentation, such as:
 - price lists
 - store policy and procedures manuals
- Access to a range of customers with different requirements
- A range of communication equipment

Metal and Engineering Training Package

WRRS1B Sell Products and Services